STIC Search Report
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TO: Shailendra Kumar **Location: 5c03 / 5c18** **Tuesday, January 11, 2005** **Art Unit: 1621** **Phone: 272-0640** **Serial Number: 10 / 701942**	**From: Jan Delaval** **Location: Biotech-Chem Library** **Rem 1a51** **Phone: 272-2504** **jan.delaval@uspto.gov**

Search Notes

Jan Please

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SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: S. Kumar Examiner #: 69594 Date: 1/10/05
Art Unit: 1621 Phone Number 2-0640 Serial Number: 10/701,942
Mail Box and Bldg/Room Location _____ Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

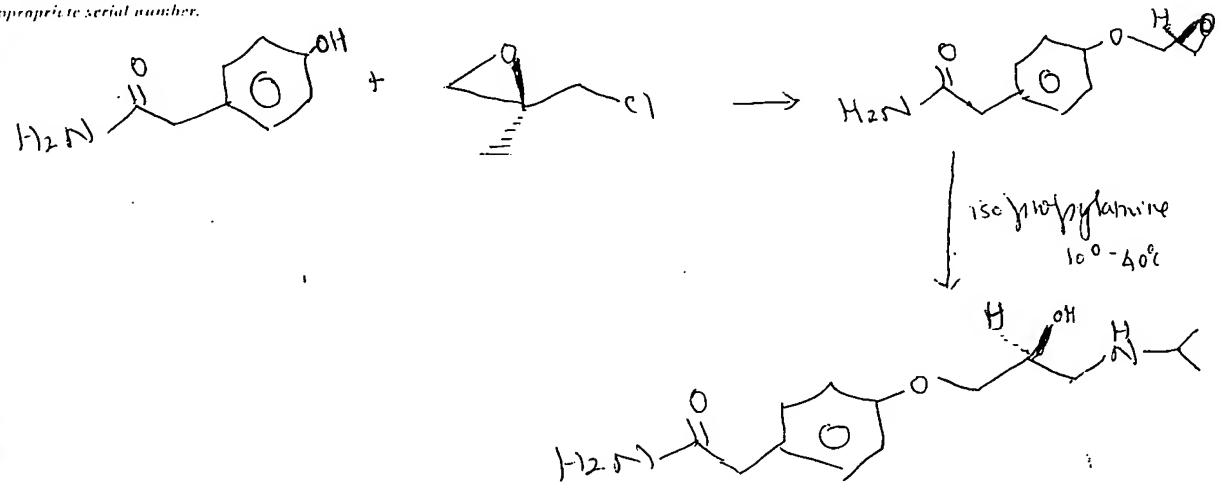
Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc. if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Process for producing aetenolol of high optical purity

Inventors (please provide full names): Satish Ramanlal Mehta et. al.

Earliest Priority Filing Date: 10/31/2003

For Sequence Searches Only Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.



STAFF USE ONLY

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Searcher Phone #: 2504
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Date Completed: 1/4/05
Searcher Prep & Review Time: _____
Clerical Prep Time: 16
Online Time: 45

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AA Sequence (#) _____
Structure (#) ✓
Bibliographic _____
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Fulltext _____
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Other _____

Vendors and cost where applicable

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Dialog _____
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Dr.Link _____
Lexis/Nexis _____
Sequence Systems _____
WWW/Internet _____
Other (specify) _____

PTO-1590 (8-01)

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FILE 'HCAPLUS' ENTERED AT 11:19:39 ON 11 JAN 2005
USE IS SUBJECT TO THE TERMS OF YOUR STN CUSTOMER AGREEMENT.
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FILE COVERS 1907 - 11 Jan 2005  VOL 142 ISS 3
FILE LAST UPDATED: 10 Jan 2005  (20050110/ED)

 This file contains CAS Registry Numbers for easy and accurate
 substance identification.

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L1               1 S E3
               E C14H22N2O3/MF
L2             342 S E3 AND 46.150.18/RID AND 1/NR
L3              18 S L2 AND BENZENEACETAMIDE
L4              12 S L3 AND 2 HYDROXY
L5              11 S L4 AND PROPOXY
L6               7 S L5 AND 4
L7               3 S L6 NOT (D/ELS OR 11C#)
L8               3 S L2 AND ATENOLOL
L9               3 S L1,L7,L8
               SEL RN
L10             37 S E1-E3/CRN
L11             10 S L10 NOT (MXS/CI OR COMPD OR WITH)
               E EPICHLOROHYDRIN/CN
L12              1 S E3
               E C3H5CLO/MF
L13             23 S E3 AND OC2/ES
               SEL RN 12 17 23
L14              3 S E1-E3
L15              3 S L12,L14
               E C11H13NO3/MF
L16             55 S E3 AND 46.150.18/RID AND OC2/ES AND 2/NR
L17             17 S L16 AND 4
L18              5 S L17 AND BENZENEACETAMIDE
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L21            147 S L20 AND 4
L22              1 S L21 AND BENZENEACETAMIDE
L23              9 S L20 AND BENZENEACETAMIDE
L24              2 S (SODIUM HYDROXIDE OR POTASSIUM HYDROXIDE)/CN
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L27        32010 S EPICHLOROHYDRIN?
L28        35012 S L26,L27
L29           58 S L19
L30         3162 S L9 OR L11
L31         4161 S ATENOLOL
L32         4406 S L30,L31
L33           19 S L25 AND L28 AND L29 AND L32
L34            6 S L33 AND (L24 OR NAOH OR KOH OR (NA OR K OR SODIUM OR POTASSIU
L35            1 S L33 AND (QUAT?(L)AMMON?)
L36            6 S L34,L35
L37          105 S L30 (L) PREP+NT/RL
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L39         8366 S (L22 OR L28 OR L19)(L)RACT+NT/RL
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L48            3 S L45 AND L19
L49            5 S L45 AND L9,L11
L50          104 S L45 NOT L46-L49
L51            3 S L50 AND IUM
L52            3 S L50 AND N N N
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L55            1 S L45 AND L24

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L57           19 S L44,L56

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=> d all hitstr tot l57

L57  ANSWER 1 OF 19  HCAPLUS  COPYRIGHT 2005 ACS on STN
AN   2004:885852  HCAPLUS
DN   141:337650
ED   Entered STN:  26 Oct 2004
TI   Process for the purification of atenolol
IN   Datta, Debashish; Muralikrishna, Dantu; Patel, Jayesh Raman
PA   Lupin Laboratories Ltd., India
SO   Indian, 21 pp.
     CODEN: INXXAP
DT   Patent
LA   English
IC   ICM  C07C103-26
     ICS  A61K031-165
CC   63-6 (Pharmaceuticals)
     Section cross-reference(s): 25
FAN.CNT 1
     PATENT NO.          KIND   DATE        APPLICATION NO.        DATE
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PI IN 182584 A 19990508 IN 1996-BO529 19961101
PRAI IN 1996-BO529 19961101
CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
IN 182584	ICM	C07C103-26
	ICS	A61K031-165

AB A process for purification of **atenolol** which comprises slurrying a crude **atenolol** base in water and adjusting the pH to 4-8 with a mineral acid at which the crude base dissolves to form a solution, filtering the resulting solution to remove neutral impurities which are insol. in water, treating the aqueous acidic filtrate with activated charcoal to remove the remaining undesired impurities and filtering the charcoal-treated solution and treating with an alkali and separating the **atenolol** in purified form.

ST **atenolol** purifn process

IT Charcoal
RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)
(activated; process for purification of **atenolol**)

IT **29122-68-7P, Atenolol**
RL: **PUR (Purification or recovery)**; **SPN (Synthetic preparation)**; THU (Therapeutic use); BIOL (Biological study); **PREP (Preparation)**; USES (Uses)
(process for purification of **atenolol**)

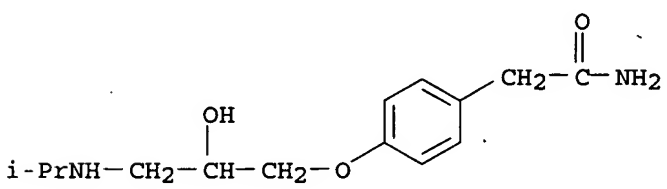
IT 75-31-0, Isopropylamine, reactions **106-89-8, Epichlorohydrin**, reactions **17194-82-0**, p-Hydroxyphenylacetamide
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(process for purification of **atenolol**)

IT **29122-69-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(process for purification of **atenolol**)

IT 56392-14-4 61698-76-8 87619-83-8
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)
(synthetic impurity; process for purification of **atenolol**)

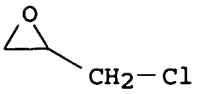
IT **29122-68-7P, Atenolol**
RL: **PUR (Purification or recovery)**; **SPN (Synthetic preparation)**; THU (Therapeutic use); BIOL (Biological study); **PREP (Preparation)**; USES (Uses)
(process for purification of **atenolol**)

RN 29122-68-7 HCAPLUS
CN Benzeneacetamide, 4-[2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI) (CA INDEX NAME)

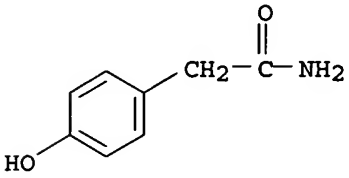


IT **106-89-8, Epichlorohydrin**, reactions **17194-82-0**, p-Hydroxyphenylacetamide
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(process for purification of **atenolol**)

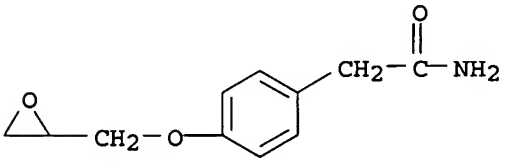
RN 106-89-8 HCAPLUS
CN Oxirane, (chloromethyl)- (9CI) (CA INDEX NAME)



RN 17194-82-0 HCAPLUS
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)



IT **29122-69-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(process for purification of **atenolol**)
RN 29122-69-8 HCAPLUS
CN Benzeneacetamide, 4-(oxiranylmethoxy)- (9CI) (CA INDEX NAME)



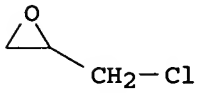
L57 ANSWER 2 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 2000:610971 HCAPLUS
DN 134:41957
ED Entered STN: 05 Sep 2000
TI Synthesis of **atenolol** from benzylcyanide
AU Wei, Chang-mei
CS Dept. of Chemistry, Huaiyin Normal College, Huaiyin, 223001, Peop. Rep. China
SO Huaihai Gongxueyuan Xuebao (2000), 9(2), 36-38
CODEN: HGXKFX; ISSN: 1008-3499
PB Huaihai Gongxueyuan Xuebao Bianjibu
DT Journal
LA Chinese
CC 25-19 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
Section cross-reference(s): 1
OS CASREACT 134:41957
AB The title antihypertensive was prepared in 7 step in 12.06% yield from benzyl cyanide.
ST **atenolol** prepn antihypertensive
IT Antihypertensives
(synthesis of **atenolol** from benzyl cyanide)
IT 75-31-0, Isopropylamine, reactions **106-89-8**, **Epichlorohydrin**, reactions 140-29-4, Benzyl cyanide
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(synthesis of **atenolol** from benzyl cyanide)
IT 104-03-0P 156-38-7P 555-21-5P 1197-55-3P **17194-82-0P** **29122-69-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP

(Preparation); **RACT (Reactant or reagent)**
(synthesis of **atenolol** from benzyl cyanide)

IT **29122-68-7P, Atenolol**
RL: **SPN (Synthetic preparation); PREP (Preparation)**
(synthesis of **atenolol** from benzyl cyanide)

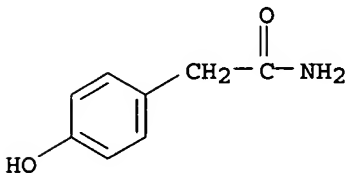
IT **106-89-8, Epichlorohydrin**, reactions
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(synthesis of **atenolol** from benzyl cyanide)

RN 106-89-8 HCAPLUS
CN Oxirane, (chloromethyl)- (9CI) (CA INDEX NAME)

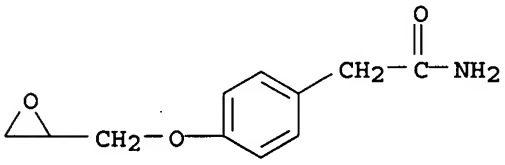


IT **17194-82-0P 29122-69-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(synthesis of **atenolol** from benzyl cyanide)

RN 17194-82-0 HCAPLUS
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)

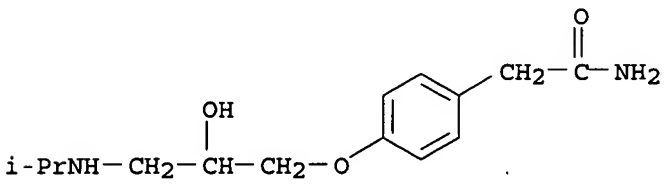


RN 29122-69-8 HCAPLUS
CN Benzeneacetamide, 4-(oxiranylmethoxy)- (9CI) (CA INDEX NAME)



IT **29122-68-7P, Atenolol**
RL: **SPN (Synthetic preparation); PREP (Preparation)**
(synthesis of **atenolol** from benzyl cyanide)

RN 29122-68-7 HCAPLUS
CN Benzeneacetamide, 4-[2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI) (CA INDEX NAME)



L57 ANSWER 3 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1999:785138 HCAPLUS
DN 132:122142
ED Entered STN: 12 Dec 1999
TI CsF in organic synthesis. Regioselective nucleophilic reactions of phenols with oxiranes leading to enantiopure β-blockers
AU Kitaori, Kazuhiro; Furukawa, Yoshiro; Yoshimoto, Hiroshi; Otera, Junzo
CS Research Laboratories of Daiso Co., Ltd., Amagasaki, 660-0842, Japan
SO Tetrahedron (1999), 55(50), 14381-14390
CODEN: TETRAB; ISSN: 0040-4020
PB Elsevier Science Ltd.
DT Journal
LA English
CC 21-2 (General Organic Chemistry)
OS CASREACT 132:122142
AB The two modes of the paths in the reaction of oxiranes with phenols are completely controlled by CsF. Glycidyl nosylate undergoes exclusive substitution at the C1 position whereas the ring-opening (C-3 attack) occurs with **epichlorohydrin**, glycidol, and 1,2-epoxyalkanes. These reactions provide convenient access to enantiopure β-blockers.
ST nucleophilic reaction phenol oxirane cesium fluoride
IT Regiochemistry
Ring opening
Substitution reaction, nucleophilic
(regioselective nucleophilic reactions of phenols with oxiranes in presence of cesium fluoride)
IT Epoxides
Phenols, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(regioselective nucleophilic reactions of phenols with oxiranes in presence of cesium fluoride)
IT 67-56-1, Methanol, reactions 100-51-6, Benzyl alcohol, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(regioselective nucleophilic reactions of phenols or alcs. with oxiranes in presence of cesium fluoride)
IT 56552-80-8P 86195-49-5P
RL: SPN (Synthetic preparation); PREP (Preparation)
(regioselective nucleophilic reactions of phenols or alcs. with oxiranes in presence of cesium fluoride)
IT 13400-13-0, Cesium fluoride
RL: CAT (Catalyst use); USES (Uses)
(regioselective nucleophilic reactions of phenols with oxiranes in presence of cesium fluoride)
IT 90-05-1, 2-Methoxyphenol 95-48-7, reactions 99-76-3, Methyl 4-hydroxybenzoate 100-02-7, reactions 106-41-2, 4-Bromophenol 106-44-5, 4-Methylphenol, reactions 106-48-9, 4-Chlorophenol 108-95-2, Phenol, reactions 123-08-0 150-76-5, 4-Methoxyphenol 767-00-0, 4-Cyanophenol 1126-20-1, 2-Allyloxyphenol 1436-34-6, Butyloxirane 14191-95-8, 4-Cyanomethylphenol **17194-82-0** **51594-55-9**, (R)-**Epichlorohydrin**, reactions 60456-23-7, (S)-Glycidol 70987-78-9 77495-66-0, (R)-Hexyloxirane 118712-60-0
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(regioselective nucleophilic reactions of phenols with oxiranes in presence of cesium fluoride)
IT 3102-00-9P 4199-10-4P 22972-96-9P 26328-11-0P 52153-43-2P **56715-12-9P** 61248-75-7P 66901-82-4P 70987-80-3P 71031-03-3P 71048-65-2P 82430-38-4P **93379-54-5P**, (S)-**Atenolol** 99103-03-4P 101693-40-7P 112652-61-6P 125279-82-5P 129098-55-1P 129098-57-3P 154872-58-9P 154968-43-1P 256460-10-3P 256460-11-4P 256460-14-7P 256460-15-8P
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(regioselective nucleophilic reactions of phenols with oxiranes in presence of cesium fluoride)

RE.CNT 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Ader, U; Tetrahedron: Asymmetry 1992, V3, P521 HCAPLUS
(2) Cardillo, G; Tetrahedron 1987, V43, P2505 HCAPLUS
(3) Caron, M; J Org Chem 1985, V50, P1557 HCAPLUS
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(29) Sasai, H; Tetrahedron 1994, V50, P12313 HCAPLUS
(30) Sato, T; J Org Chem 1995, V60, P2627 HCAPLUS
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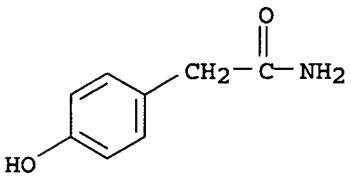
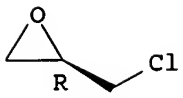
(32) Shoda, S; Chem Lett 1980, P391 HCAPLUS
(33) Smith, J; Synthesis 1984, P629 HCAPLUS
(34) Stinson, S; Chem Eng News 1997, June 2, P28
(35) Wang, Z; Tetrahedron Lett 1993, V34, P2267 HCAPLUS
(36) Wunsche, K; Tetrahedron: Asymmetry 1996, V7, P2017
IT **17194-82-0 51594-55-9**, (R)-**Epichlorohydrin**,
reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(regioselective nucleophilic reactions of phenols with oxiranes in presence of cesium fluoride)
RN 17194-82-0 HCAPLUS
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)



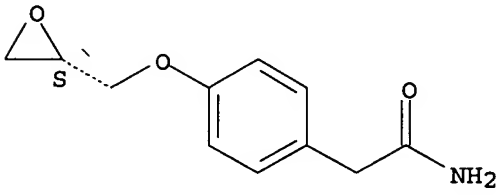
RN 51594-55-9 HCAPLUS
CN Oxirane, (chloromethyl)-, (2R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).



IT **56715-12-9P 93379-54-5P**, (S)-**Atenolol**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(regioselective nucleophilic reactions of phenols with oxiranes in presence of cesium fluoride)
RN 56715-12-9 HCAPLUS
CN Benzeneacetamide, 4-[(2S)-oxiranylmethoxy]- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



RN 93379-54-5 HCAPLUS
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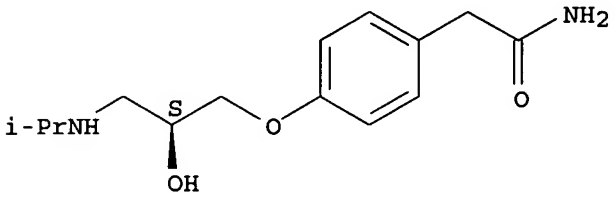
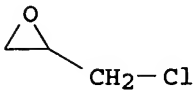
Absolute stereochemistry. Rotation (-).

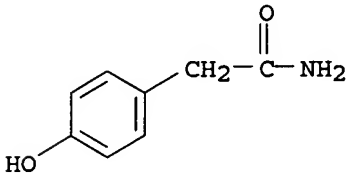


L57 ANSWER 4 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1999:503559 HCAPLUS
DN 131:129738
ED Entered STN: 13 Aug 1999
TI Improved synthesis of **atenolol**
AU Xu, Bo
CS College Pharmaceutical Eng., East China Univ. Sci & Tech, Shanghai, 200237, Peop. Rep. China
SO Guangxi Huagong (1999), 28(2), 9-10
CODEN: GUHUF2; ISSN: 1003-0840
PB Guangxi Huagong Bianjibu
DT Journal
LA Chinese
CC 25-19 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
AB **Atenolol** was prepared in 2 steps from 4-hydroxyphenylacetamide and **epichlorohydrin.**
ST **atenolol** prepn
IT 75-31-0, Isopropylamine, reactions **106-89-8**, **Epichlorohydrin**, reactions **17194-82-0**, 4-Hydroxyphenylacetamide
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(synthesis of **atenolol**)

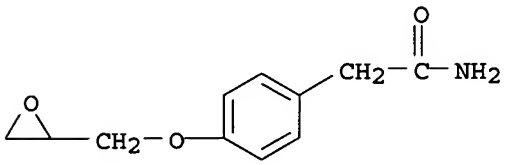
IT **29122-69-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(synthesis of **atenolol**)
IT **29122-68-7P, Atenolol**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(synthesis of **atenolol**)
IT **106-89-8, Epichlorohydrin**, reactions **17194-82-0**
, 4-Hydroxyphenylacetamide
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(synthesis of **atenolol**)
RN 106-89-8 HCAPLUS
CN Oxirane, (chloromethyl)- (9CI) (CA INDEX NAME)



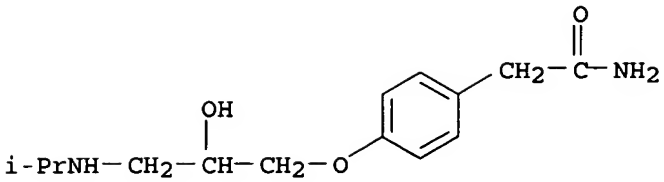
RN 17194-82-0 HCAPLUS
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)



IT **29122-69-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(synthesis of **atenolol**)
RN 29122-69-8 HCAPLUS
CN Benzeneacetamide, 4-(oxiranylmethoxy)- (9CI) (CA INDEX NAME)



IT **29122-68-7P, Atenolol**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(synthesis of **atenolol**)
RN 29122-68-7 HCAPLUS
CN Benzeneacetamide, 4-[2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI) (CA INDEX NAME)



L57 ANSWER 5 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1998:446687 HCAPLUS
DN 129:54146
ED Entered STN: 20 Jul 1998
TI A Synthesis of **Atenolol** Using a Nitrile Hydration Catalyst
AU Akisanya, Joseph; Parkins, Adrian W.; Steed, Jonathan W.
CS Department of Chemistry, King's College London, London, WC2R 2LS, UK
SO Organic Process Research & Development (1998), 2(4), 274-276
CODEN: OPRDFK; ISSN: 1083-6160
PB American Chemical Society
DT Journal
LA English
CC 25-7 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
AB The synthesis of **atenolol** is described using a platinum containing homogeneous catalyst for the conversion of a nitrile to an amide. The catalytic reaction may be employed as the final step in the synthesis or in the preparation of the intermediate 4-hydroxyphenylacetamide. The structure of the nitrile intermediate, 1-(4'-cyanomethylphenoxy)-2-hydroxy-3-isopropylaminopropane, has been determined by X-ray crystallog.
ST **atenolol** prepn catalyst
IT Catalysts
(nitrile hydration; synthesis of **atenolol** using a nitrile hydration catalyst)
IT Crystallography
(synthesis and crystal structure data of **atenolol** using a nitrile hydration catalyst)
IT 29277-73-4P
RL: SPN (Synthetic preparation); PREP (Preparation)
(synthesis and crystal structure data of **atenolol** using a nitrile hydration catalyst)
IT 173416-05-2
RL: CAT (Catalyst use); USES (Uses)
(synthesis of **atenolol** using a nitrile hydration catalyst)
IT 75-31-0, 2-Propanamine, reactions **106-89-8**, reactions **17194-82-0**
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(synthesis of **atenolol** using a nitrile hydration catalyst)
IT 14191-95-8P **29122-69-8P** 35198-42-6P
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(synthesis of **atenolol** using a nitrile hydration catalyst)
IT **29122-68-7P**
RL: **SPN (Synthetic preparation); PREP (Preparation)**
(synthesis of **atenolol** using a nitrile hydration catalyst)
RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Barbour, L; RES2INS 1995
(2) Barrett, A; DE 2007751 1974 HCAPLUS
(3) Barrett, A; US 3836671 1974 HCAPLUS
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(6) Ghaffar, T; Tetrahedron Lett 1995, V36, P8657 HCAPLUS

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(10) March, J; Ad anced Organic Chemistry, 4th ed 1992, P391
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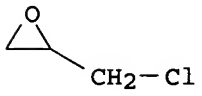
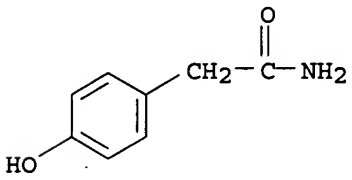
(25) The Cambridge Crystallographic Data Centre; teched@chemcrys.cam.ac.uk
(26) Zil'Berman, E; Russ Chem Re 1984, V53, P900

IT **106-89-8**, reactions **17194-82-0**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(synthesis of **atenolol** using a nitrile hydration catalyst)

RN 106-89-8 HCAPLUS
CN Oxirane, (chloromethyl)- (9CI) (CA INDEX NAME)

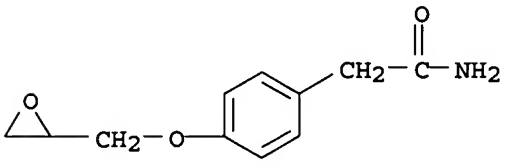


RN 17194-82-0 HCAPLUS
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)



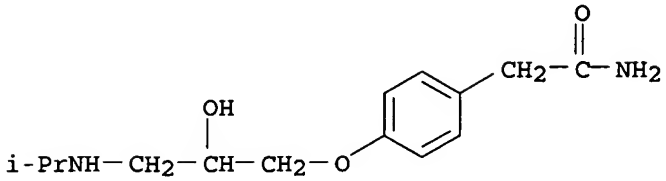
IT **29122-69-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(synthesis of **atenolol** using a nitrile hydration catalyst)

RN 29122-69-8 HCAPLUS
CN Benzeneacetamide, 4-(oxiranylmethoxy)- (9CI) (CA INDEX NAME)



IT **29122-68-7P**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(synthesis of **atenolol** using a nitrile hydration catalyst)

RN 29122-68-7 HCAPLUS
CN Benzeneacetamide, 4-[2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI) (CA INDEX NAME)



L57 ANSWER 6 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1997:141773 HCAPLUS
DN 126:225082
ED Entered STN: 05 Mar 1997
TI A practical synthesis of optically active **atenolol** from chiral **epichlorohydrin**
AU Kitaori, Kazuhiro; Takehira, Yoshikazu; Furukawa, Yoshiro; Yoshimoto, Hiroshi; Otera, Junzo
CS Res. Labs. Daiso Co., Ltd., Amagasaki, 660, Japan
SO Chemical & Pharmaceutical Bulletin (1997), 45(2), 412-414
CODEN: CPBTAL; ISSN: 0009-2363
PB Pharmaceutical Society of Japan
DT Journal
LA English
CC 25-19 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
AB The synthesis of (R)-**atenolol** and (S)-**atenolol** was achieved in two steps starting from 4-hydroxybenzeneacetamide. Both enantiomers of 4-(oxiranylmethoxy)benzeneacetamide were synthesized from 4-hydroxybenzeneacetamide and (R)- and (S)-**epichlorohydrin** using an alkali metal hydroxide and/or BTA (benzyltrimethylammonium chloride), resp. Subsequent treatment of the epoxide with isopropylamine afforded **atenolol** with excellent enantiomeric excess (>98% ee).
ST **atenolol** asym synthesis; oxiranylmethoxy benzeneacetamide prepn **atenolol** intermediate
IT Asymmetric synthesis and induction
(asym. synthesis **atenolol**)
IT **17194-82-0**, 4-Hydroxybenzeneacetamide **51594-55-9**, (R)-**Epichlorohydrin**, reactions **67843-74-7**, (S)-**Epichlorohydrin**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(asym. synthesis **atenolol**)
IT **56715-12-9P**, (S)-4-(Oxiranylmethoxy)benzeneacetamide **136259-70-6P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(asym. synthesis **atenolol**)
IT **56715-13-0P**, (R)-**Atenolol** **93379-54-5P**, (S)-**Atenolol**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(asym. synthesis **atenolol**)
RE.CNT 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD
RE
(1) Akiyama, A; CHEMTECH 1988, V18, P640
(2) Anon; US 3663607 1972 HCAPLUS
(3) Anon; US 3836671 1974 HCAPLUS
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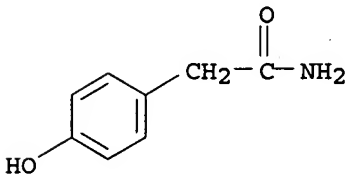
(21) Wong, C; Science 1989, V244, P1145 HCAPLUS
(22) Yamada, H; Angew Chem, Int Ed Engl 1988, V27, P622

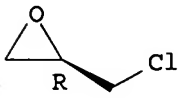
IT **17194-82-0**, 4-Hydroxybenzeneacetamide **51594-55-9**, (R)-**Epichlorohydrin**, reactions **67843-74-7**, (S)-**Epichlorohydrin**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(asym. synthesis **atenolol**)

RN 17194-82-0 HCAPLUS
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)



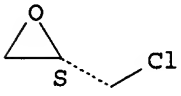
RN 51594-55-9 HCAPLUS
CN Oxirane, (chloromethyl)-, (2R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).



RN 67843-74-7 HCAPLUS
CN Oxirane, (chloromethyl)-, (2S)- (9CI) (CA INDEX NAME)

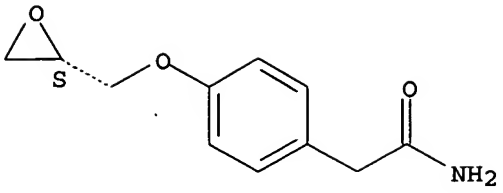
Absolute stereochemistry. Rotation (+).



IT **56715-12-9P**, (S)-4-(Oxiranylmethoxy)benzeneacetamide **136259-70-6P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(asym. synthesis **atenolol**)

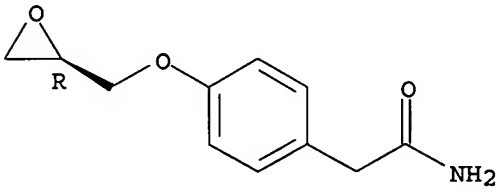
RN 56715-12-9 HCAPLUS
CN Benzeneacetamide, 4-[(2S)-oxiranylmethoxy]- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



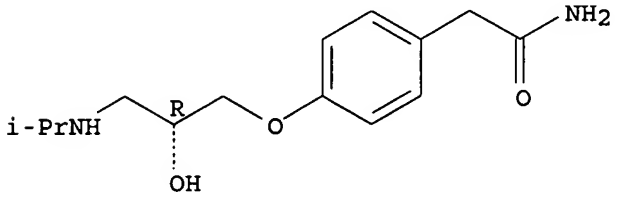
RN 136259-70-6 HCAPLUS
CN Benzeneacetamide, 4-(oxiranylmethoxy)-, (R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



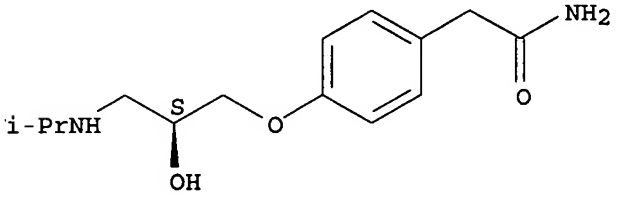
IT **56715-13-0P**, (R)-**Atenolol** **93379-54-5P**, (S)-**Atenolol**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(asym. synthesis **atenolol**)
RN 56715-13-0 HCAPLUS
CN Benzeneacetamide, 4-[(2R)-2-hydroxy-3-[(1-methylethyl)amino]propoxy]-(9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



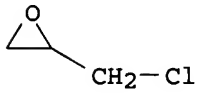
RN 93379-54-5 HCAPLUS
CN Benzeneacetamide, 4-[(2S)-2-hydroxy-3-[(1-methylethyl)amino]propoxy]-(9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).

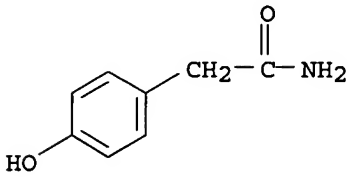


L57 ANSWER 7 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1996:482631 HCAPLUS
DN 125:167503
ED Entered STN: 14 Aug 1996

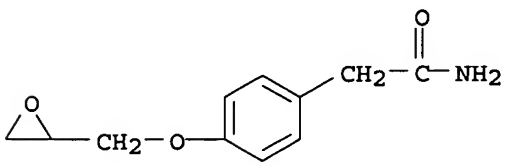
TI Synthesis of **atenolol**
AU Cui, Yanxia; Jiang, Weiguo; Li, Shufen
CS Res. Inst. Northeast Gen. Pharmaceutical Factory, Shenyang, 110026, Peop. Rep. China
SO Zhongguo Yaowu Huaxue Zazhi (1996), 6(1), 62-63
CODEN: ZYHZEF; ISSN: 1005-0108
PB Zhongguo Yaowu Huaxue Zazhi Bianjibu
DT Journal
LA Chinese
CC 25-19 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
AB **Atenolol** was prepared in 2 steps in 52.8% overall yield by etherification of 4-hydroxyphenylacetamide with **epichlorohydrin** followed by amination with isopropylamine.
ST **atenolol** prepn
IT 75-31-0, Isopropylamine, reactions **106-89-8**, **Epichlorohydrin**, reactions **17194-82-0**, p-Hydroxy phenylacetamide **29122-69-8**, Benzeneacetamide, 4-(oxiranylmethoxy)-
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(synthesis of **atenolol**)
IT **29122-68-7P**, **Atenolol**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(synthesis of **atenolol**)
IT **106-89-8**, **Epichlorohydrin**, reactions **17194-82-0**, p-Hydroxy phenylacetamide **29122-69-8**, Benzeneacetamide, 4-(oxiranylmethoxy)-
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(synthesis of **atenolol**)
RN 106-89-8 HCAPLUS
CN Oxirane, (chloromethyl)- (9CI) (CA INDEX NAME)



RN 17194-82-0 HCAPLUS
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)

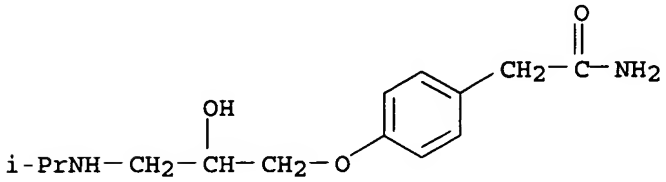


RN 29122-69-8 HCAPLUS
CN Benzeneacetamide, 4-(oxiranylmethoxy)- (9CI) (CA INDEX NAME)



IT **29122-68-7P**, **Atenolol**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**

(synthesis of **atenolol**)
RN 29122-68-7 HCAPLUS
CN Benzeneacetamide, 4-[2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI) (CA INDEX NAME)



L57 ANSWER 8 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1994:298454 HCAPLUS
DN 120:298454
ED Entered STN: 11 Jun 1994
TI Phase transfer catalytic process for preparing intermediates of **atenolol**, propranolol, and their derivatives
IN Jang, Shyue Ming; Shieh, Tian Shy
PA Industrial Technology Research Institute, Taiwan
SO U.S., 5 pp.
CODEN: USXXAM
DT Patent
LA English
IC ICM C07D301-28
ICS C07D303-23; C07C041-03; C07C043-205
NCL 549517000
CC 27-2 (Heterocyclic Compounds (One Hetero Atom))
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5290958	A	19940301	US 1993-33047	19930818
	GB 2276167	A1	19940921	GB 1993-12267	19930615
	GB 2276167	B2	19951213		
PRAI	US 1993-33047	A	19930818		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 5290958	ICM	C07D301-28
	ICS	C07D303-23; C07C041-03; C07C043-205
	NCL	549517000
GB 2276167	ECLA	C07C041/16; C07D303/22B

OS MARPAT 120:298454
AB The title process comprises O-alkylation of 4-(H2NOCH2C)C6H4OH and α-naphthol by **epichlorohydrin** in the presence of R1R2R3R4NX or (R5)3NHX (1 of R1-R4 = C9-20alkyl and the remaining R1-R5 = C1-20alkyl; X = halo) to give the corresponding epoxides and halohydrins.
ST **atenolol** propranolol intermediate; phenol naphthol etherification **epichlorohydrin** catalyst
IT **106-89-8**, **Epichlorohydrin**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(O-alkylation of hydroxyphenylacetamide by, in preparation of **atenolol** intermediate, catalysts for)
IT **17194-82-0**, 4-Hydroxyphenylacetamide
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(O-alkylation of, in preparation of **atenolol** intermediate, catalysts for)
IT 90-15-3, α-Naphthol
RL: RCT (Reactant); RACT (Reactant or reagent)

(O-alkylation of, in preparation of propranolol intermediate, catalysts for)

IT **29122-69-8P** 115538-83-5P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, as **atenolol** intermediate, method for)

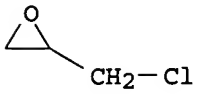
IT 2461-42-9P 20133-93-1P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, as propranolol intermediate, method for)

IT 525-66-6P, Propranolol **29122-68-7P, Atenolol**
RL: **SPN (Synthetic preparation); PREP (Preparation)**
(preparation of, method for)

IT 75-31-0, Isopropylamine, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, in preparation of **atenolol**)

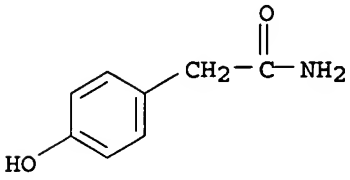
IT **106-89-8, Epichlorohydrin**, reactions
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(O-alkylation of hydroxyphenylacetamide by, in preparation of **atenolol** intermediate, catalysts for)

RN 106-89-8 HCAPLUS
CN Oxirane, (chloromethyl)- (9CI) (CA INDEX NAME)



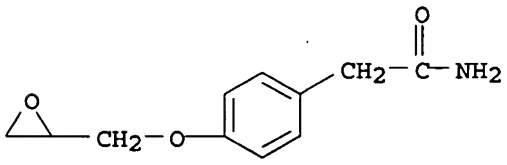
IT **17194-82-0**, 4-Hydroxyphenylacetamide
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(O-alkylation of, in preparation of **atenolol** intermediate, catalysts for)

RN 17194-82-0 HCAPLUS
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)



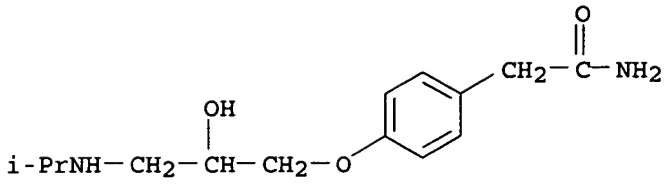
IT **29122-69-8P**
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, as **atenolol** intermediate, method for)

RN 29122-69-8 HCAPLUS
CN Benzeneacetamide, 4-(oxiranylmethoxy)- (9CI) (CA INDEX NAME)

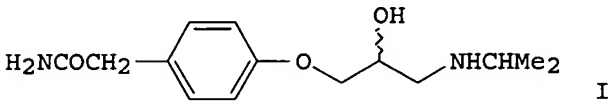


IT **29122-68-7P, Atenolol**
RL: **SPN (Synthetic preparation); PREP (Preparation)**
(preparation of, method for)

RN 29122-68-7 HCAPLUS
CN Benzeneacetamide, 4-[2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI) (CA INDEX NAME)



L57 ANSWER 9 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1992:633552 HCAPLUS
DN 117:233552
ED Entered STN: 13 Dec 1992
TI Lipase catalysis in organic solvents. Application to the synthesis of (R)- and (S)-**atenolol**
AU Bevinakatti, H. S.; Banerji, A. A.
CS Alchemie Res. Cent., Thane, 400601, India
SO Journal of Organic Chemistry (1992), 57(22), 6003-5
CODEN: JOCEAH; ISSN: 0022-3263
DT Journal
LA English
CC 25-19 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
Section cross-reference(s): 1, 7
GI



I

AB Stereoselective synthesis of (R)- and (S)-**atenolol** I was achieved in five steps starting from p-HOC6H4CH2CO2H. Lipase from Pseudomonas cepacia showed excellent selectivity toward kinetic resolution of key intermediates p-ClCH2CH(OR)CH2OC6H4CH2CO2Bu (R = H, Ac).
ST **atenolol** stereoselective synthesis; lipase resoln
atenolol intermediate
IT Pseudomonas cepacia
(lipase from, as catalyst in acylation of (chlorohydroxypropoxy)phenylacetate in synthesis of **atenolol**)
IT 75-31-0, Isopropylamine, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(amination by, of (chlorohydroxypropoxyphenyl)acetate, in synthesis of **atenolol**)
IT 71-36-3, 1-Butanol, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(esterification by, of hydroxyphenylacetic acid)
IT 156-38-7, p-Hydroxyphenylacetic acid
RL: RCT (Reactant); RACT (Reactant or reagent)
(esterification of, by butanol)
IT **29122-69-8P** 115538-83-5P
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and acetylation of)
IT 143925-25-1P 143925-26-2P
RL: SPN (Synthetic preparation); PREP (Preparation)

(preparation and conversion to **atenolol**)

IT 143925-23-9P 143925-24-0P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation and kinetic resolution of)

IT 144015-97-4P 144015-98-5P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and lipase-catalyzed acylation of)

IT 144017-03-8P 144017-04-9P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and lipase-catalyzed deacylation of)

IT 79419-46-8P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation and substitution of, by **epichlorohydrin**)

IT 143925-21-7P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)

IT **56715-13-0P**, (R)-**Atenolol** **93379-54-5P**, (S)-**Atenolol**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(preparation of, by lipase catalyzed kinetic resolution from hydroxyphenylacetic acid)

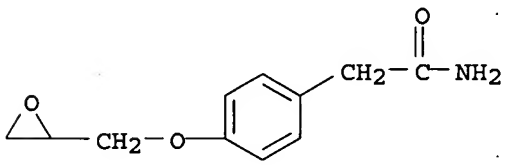
IT 143925-22-8P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation, chlorination, and acetylation of)

IT **106-89-8**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(substitution by, of hydroxyphenylacetic acid and its amide)

IT **17194-82-0**, p-Hydroxyphenylacetamide
RL: PROC (Process)
(substitution of, by **epichlorohydrin**)

IT **29122-69-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and acetylation of)

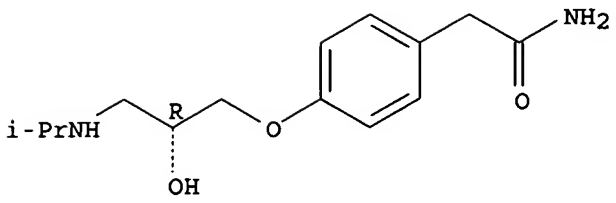
RN 29122-69-8 HCAPLUS
CN Benzeneacetamide, 4-(oxiranylmethoxy)- (9CI) (CA INDEX NAME)



IT **56715-13-0P**, (R)-**Atenolol** **93379-54-5P**, (S)-**Atenolol**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(preparation of, by lipase catalyzed kinetic resolution from hydroxyphenylacetic acid)

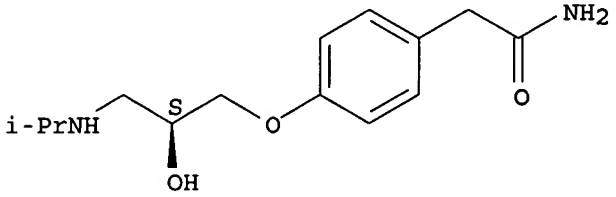
RN 56715-13-0 HCAPLUS
CN Benzeneacetamide, 4-[(2R)-2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).

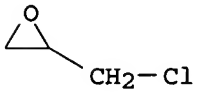


RN 93379-54-5 HCAPLUS
CN Benzeneacetamide, 4-[(2S)-2-hydroxy-3-[(1-methylethyl)amino]propoxy]-
(9CI) (CA INDEX NAME)

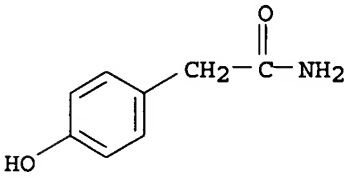
Absolute stereochemistry. Rotation (-).



IT **106-89-8**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(substitution by, of hydroxyphenylacetic acid and its amide)
RN 106-89-8 HCAPLUS
CN Oxirane, (chloromethyl)- (9CI) (CA INDEX NAME)



IT **17194-82-0**, p-Hydroxyphenylacetamide
RL: PROC (Process)
(substitution of, by **epichlorohydrin**)
RN 17194-82-0 HCAPLUS
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)



L57 ANSWER 10 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1992:612160 HCAPLUS
DN 117:212160
ED Entered STN: 28 Nov 1992
TI Preparation of optically active **atenolol** and its intermediates
IN Takehira, Kiwa; Saraumi, Nobuaki; Kitaori, Kazuhiro
PA Daiso Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent

LA Japanese
IC ICM C07D301-28
ICA A61K031-16; B01J031-02; C07B053-00; C07B061-00; C07D303-22
CC 25-19 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 04198175	A2	19920717	JP 1990-331091	19901128
	JP 06037482	B4	19940518		
PRAI	JP 1990-331091		19901128		

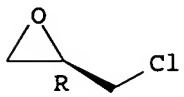
CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 04198175	ICM	C07D301-28
	ICA	A61K031-16; B01J031-02; C07B053-00; C07B061-00; C07D303-22

OS CASREACT 117:212160
AB H2NCOCH2C6H4OR-p (II; R = glycidyl) is prepared by treating H2NCOCH2C6H4OH-p (III) with optically active **epichlorohydrin** (IV) using alkali hydroxides (A) at equivalent ratio of A/III 1-1.5 in H2O-containing solvents in the presence of R1R2R3R4N+X-(R1-R4 = C1-16 alkyl, alkenyl, aralkyl, aryl; X = Cl, Br, HSO4, OH, iodine). Optically active **atenolol** is prepared by treating II with Me2CHNH2. An aqueous (R)-(-)-IV was treated dropwise with a mixture of III (35.7 g), benzyltrimethylammonium chloride, and **NaOH** (9.44 g) in H2O at 5° over 1 h, stirred at 5° for 51 h, neutralization by HCl, the suspension was treated added into Me2CHNH2 at 10° over 1 h, then stirred at 20° for 3.5 h to give 72.2% (S)-(-)-**atenolol** of 94.8% e.e.
ST **atenolol** prepn; hydroxyphenylacetamide etherification **epichlorohydrin**; isopropylamine ring cleavage glycidyloxyphenylacetamide
IT **51594-55-9**, (R)-(-)-**Epichlorohydrin**, reactions
67843-74-7, (S)-(+)-**Epichlorohydrin**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(etherification by, of hydroxyphenylacetamide)
IT **17194-82-0**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(etherification of, by optically active **epichlorohydrin**)
IT **1310-73-2**, **Sodium hydroxide**, uses
1643-19-2, Tetra-n-butylammonium bromide
RL: USES (Uses)
(in etherification of hydroxyhenylacetamide by **epichlorohydrin**)
IT **56-93-9**, Benzyltrimethylammonium chloride
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in etherification of hydroxyhenylacetamide by **epichlorohydrin**)
IT **56715-12-9P 136259-70-6P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and ring cleavage of, by isopropylamine)
IT **56715-13-0P**, (R)-(+)-**Atenolol 93379-54-5P**, (S)-(-)-**Atenolol**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(preparation of)
IT 75-31-0, Isopropylamine, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(ring cleavage by, of glycidyloxyphenylacetamide)
IT **51594-55-9**, (R)-(-)-**Epichlorohydrin**, reactions
67843-74-7, (S)-(+)-**Epichlorohydrin**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(etherification by, of hydroxyphenylacetamide)
RN 51594-55-9 HCAPLUS

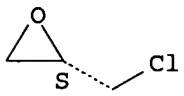
CN Oxirane, (chloromethyl)-, (2R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).

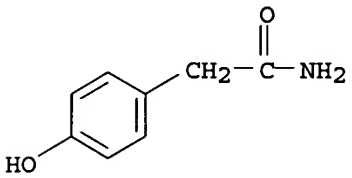


RN 67843-74-7 HCAPLUS
CN Oxirane, (chloromethyl)-, (2S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).

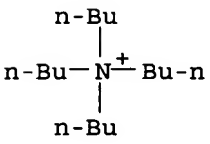


IT **17194-82-0**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(etherification of, by optically active **epichlorohydrin**)
RN 17194-82-0 HCAPLUS
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)



IT **1310-73-2**, **Sodium hydroxide**, uses
1643-19-2, Tetra-n-butylammonium bromide
RL: USES (Uses)
(in etherification of hydroxyhenylacetamide by **epichlorohydrin**
)
RN 1310-73-2 HCAPLUS
CN Sodium hydroxide (Na(OH)) (9CI) (CA INDEX NAME)

RN 1643-19-2 HCAPLUS
CN 1-Butanaminium, N,N,N-tributyl-, bromide (9CI) (CA INDEX NAME)



IT **56-93-9**, Benzyltrimethylammonium chloride

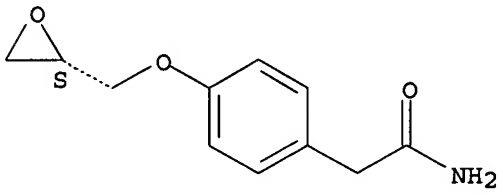
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(in etherification of hydroxyhenylacetamide by **epichlorohydrin**
)
RN 56-93-9 HCAPLUS
CN Benzenemethanaminium, N,N,N-trimethyl-, chloride (9CI) (CA INDEX NAME)

$Me_3{}^+N-CH_2-Ph$

● Cl^-

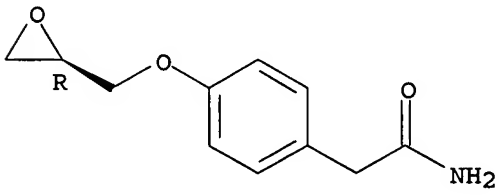
IT **56715-12-9P 136259-70-6P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and ring cleavage of, by isopropylamine)
RN 56715-12-9 HCAPLUS
CN Benzeneacetamide, 4-[(2S)-oxiranylmethoxy]- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



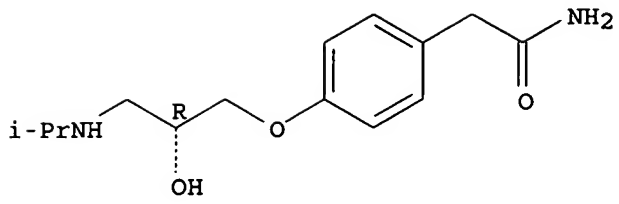
RN 136259-70-6 HCAPLUS
CN Benzeneacetamide, 4-(oxiranylmethoxy)-, (R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



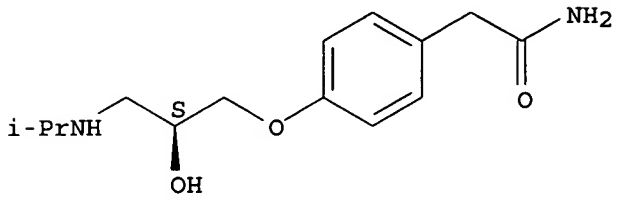
IT **56715-13-0P**, (R)-(+)-**Atenolol 93379-54-5P**, (S)-(-)-**Atenolol**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(preparation of)
RN 56715-13-0 HCAPLUS
CN Benzeneacetamide, 4-[(2R)-2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



RN 93379-54-5 HCAPLUS
CN Benzeneacetamide, 4-[(2S)-2-hydroxy-3-[(1-methylethyl)amino]propoxy]-
(9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).



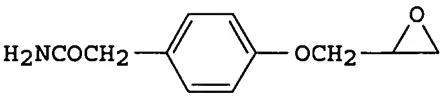
L57 ANSWER 11 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1991:558739 HCAPLUS
DN 115:158739
ED Entered STN: 18 Oct 1991
TI Manufacture of optically active **atenolol** and its intermediates
IN Takehira, Kiwa
PA Daiso Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 6 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C07C235-34
ICS C07D301-28; C07D303-22
ICA C07B053-00
CC 25-19 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
Section cross-reference(s): 1
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 03077856	A2	19910403	JP 1989-213148	19890818
	JP 06037449	B4	19940518		
PRAI	JP 1989-213148		19890818		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 03077856	ICM	C07C235-34
	ICS	C07D301-28; C07D303-22
	ICA	C07B053-00

OS CASREACT 115:158739
GI



III

AB Title compound (I), useful for antihypertensives, is prepared by treating p-hydroxyphenylacetamide (II) with optically active **epichlorohydrin** in a water-containing solvent in the presence of 1-1.5 equivalent alkali metal hydroxide per 1 equivalent **epichlorohydrin** at 0-45° to give III, for example, in pharmacol. active S-form, recrystg. III from an organic solvent if necessary, and treating III with isopropylamine. Thus, treating II with R-(-)-**epichlorohydrin** in aqueous **NaOH** at 3° to room temperature gave 64% S-(+)-III, which was refluxed with isopropylamine in MeOH to give 89% S-(-)-**atenolol** with optical purity 93%. The purity was improved to 98.3% when S-(+)-III was recrystd. from MeOH before the reaction with isopropylamine.

ST optically active **atenolol** antihypertensive manuf; **epichlorohydrin** hydroxyphenylacetamide etherification; isopropylamine addn hydroxyphenylacetamide glycidyl ether

IT Antihypertensives
(**atenolol**, intermediate for, optically active hydroxyphenylacetamide glycidyl ether as)

IT Etherification
(hydroxyphenylacetamide with optically active **epichlorohydrin**)

IT Addition reaction
(of optically active hydroxyphenylacetamide glycidyl ether with isopropylamine)

IT 75-31-0, Isopropylamine, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(addition of, with optically active hydroxyphenylacetamide glycidyl ether)

IT **17194-82-0**, p-Hydroxyphenylacetamide
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(etherification of, with optically active **epichlorohydrin**)

IT **51594-55-9**, R-(-)-**Epichlorohydrin**, reactions
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(etherification with, of hydroxyphenylacetamide)

IT **67843-74-7**, S-(+)-**Epichlorohydrin**, reactions
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(etherification with, of hyroxyphenylacetamide)

IT **56715-12-9P 136259-70-6P**
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation and addition of, with isopropylamine)

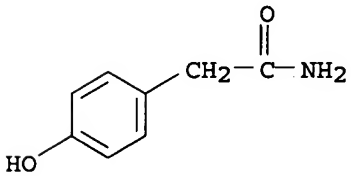
IT **56715-13-0P**
RL: **SPN (Synthetic preparation); PREP (Preparation)**
(preparation of)

IT **93379-54-5P**, S-(-)-**Atenolol**
RL: **SPN (Synthetic preparation); PREP (Preparation)**
(preparation of, for antihypertensive)

IT **17194-82-0**, p-Hydroxyphenylacetamide
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(etherification of, with optically active **epichlorohydrin**)

RN 17194-82-0 HCAPLUS

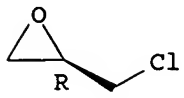
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)



IT **51594-55-9**, R-(-)-**Epichlorohydrin**, reactions

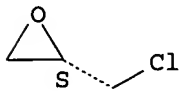
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(etherification with, of hydroxyphenylacetamide)
RN 51594-55-9 HCAPLUS
CN Oxirane, (chloromethyl)-, (2R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).



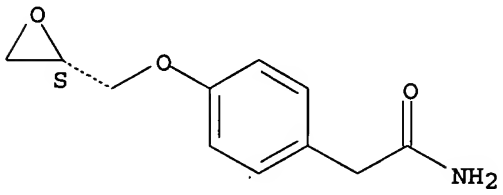
IT **67843-74-7**, S-(+)-**Epichlorohydrin**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(etherification with, of hyroxyphenylacetamide)
RN 67843-74-7 HCAPLUS
CN Oxirane, (chloromethyl)-, (2S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



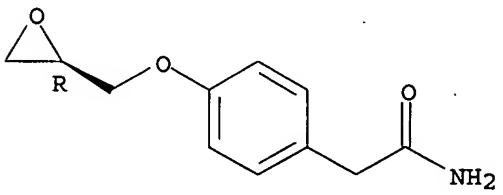
IT **56715-12-9P 136259-70-6P**
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation and addition of, with isopropylamine)
RN 56715-12-9 HCAPLUS
CN Benzeneacetamide, 4-[(2S)-oxiranylmethoxy]- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



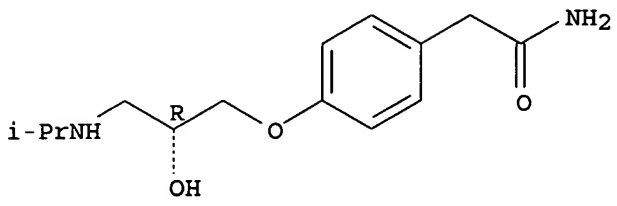
RN 136259-70-6 HCAPLUS
CN Benzeneacetamide, 4-(oxiranylmethoxy)-, (R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.



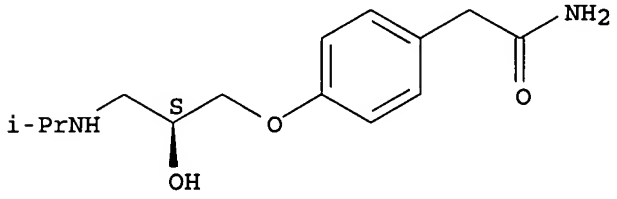
IT **56715-13-0P**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(preparation of)
RN 56715-13-0 HCAPLUS
CN Benzeneacetamide, 4-[(2R)-2-hydroxy-3-[(1-methylethyl)amino]propoxy]-
(9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



IT **93379-54-5P**, S-(-)-**Atenolol**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(preparation of, for antihypertensive)
RN 93379-54-5 HCAPLUS
CN Benzeneacetamide, 4-[(2S)-2-hydroxy-3-[(1-methylethyl)amino]propoxy]-
(9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).



L57 ANSWER 12 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1991:558705 HCAPLUS
DN 115:158705
ED Entered STN: 18 Oct 1991
TI Process for producing optically active **atenolol** and intermediate thereof
IN Takehira, Yoshikazu; Saragai, Nobuaki; Kitaori, Kazuhiro
PA Daiso Co., Ltd., Japan
SO Eur. Pat. Appl., 14 pp.
CODEN: EPXXDW
DT Patent
LA English
IC ICM C07C231-18
ICS C07C235-34
ICA C07D303-23
CC 25-7 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 435068	A2	19910703	EP 1990-123904	19901212
	EP 435068	A3	19911113		
	EP 435068	B1	19950329		
	R: CH, DE, ES, FR, GB, IT, LI				
	JP 03200753	A2	19910902	JP 1989-344447	19891227
	JP 06074243	B4	19940921		
	US 5130482	A	19920714	US 1990-624302	19901207
	CA 2032098	AA	19910628	CA 1990-2032098	19901212
	CA 2032098	C	19980414		
	EP 605384	A1	19940706	EP 1994-100873	19901212
	EP 605384	B1	19960327		
	R: CH, DE, ES, FR, GB, IT, LI				
	ES 2072960	T3	19950801	ES 1990-123904	19901212

	ES 2088299	T3	19960801	ES 1994-100873	19901212
	CA 2157938	C	19980714	CA 1990-2157938	19901212
	US 5223646	A	19930629	US 1992-871743	19920421
PRAI	JP 1989-344447	A	19891227		
	US 1990-624302	A3	19901207		
	CA 1990-2032098	A3	19901212		
	EP 1990-123904	A3	19901212		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 435068	ICM	C07C231-18
	ICS	C07C235-34
	ICA	C07D303-23
EP 435068	ECLA	C07C231/18; C07D303/22B
EP 605384	ECLA	C07C231/20; C07C235/46

OS CASREACT 115:158705; MARPAT 115:158705

AB (R)- And (S)-**atenolol**, p-H2NCOCH2C6H4OCH2CH(OH)CH2NHCHMe2 (I) were prepared by treating p-H2NCOCH2C6H4OH with (R)- and (S)-**epichlorohydrin** followed by treatment of the glycidyl ether with Me2CHNH2. Thus, p-H2NCOCH2C6H4OH was treated with (R)-(-)-**epichlorohydrin** in H2O containing **NaOH** to give the (S)-(+)-glycidyl ether (64%), which was treated with Me2CHNH2 in MeOH to give 89% (S)-(-)-I with 93% ee. I were purified via acid salts.

ST **atenolol** prepn; glycidyl ether **atenolol** intermediate

IT 136259-68-2P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and neutralization of)

IT **56715-12-9P 136259-70-6P** 136259-71-7P
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and reaction of, with isopropylamine)

IT 136259-67-1P 136259-69-3P 136259-72-8P 136259-73-9P
136259-74-0P 136259-75-1P **136259-76-2P**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(preparation of)

IT **56715-13-0P**, (R)-(+)-**Atenolol 93379-54-5P**, (S)-(-)-**Atenolol**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(preparation of, improved process for)

IT **51594-55-9**, (R)-(-)-**Epichlorohydrin**, reactions
67843-74-7, (S)-(+)-**Epichlorohydrin**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(reaction of, with (hydroxyphenyl)acetamide)

IT **17194-82-0**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(reaction of, with **epichlorohydrins**)

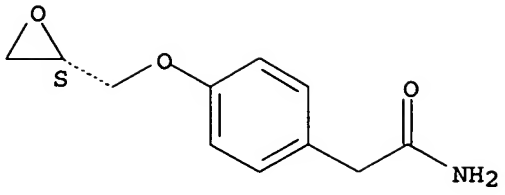
IT 75-31-0, Isopropylamine, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with glycidic ethers, in synthesis of **atenolol**)

IT **56715-12-9P 136259-70-6P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and reaction of, with isopropylamine)

RN 56715-12-9 HCAPLUS

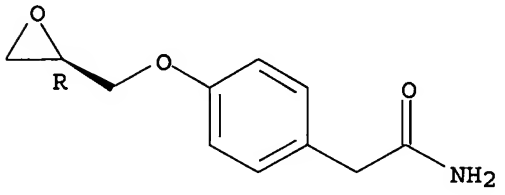
CN Benzeneacetamide, 4-[(2S)-oxiranylmethoxy]- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



RN 136259-70-6 HCAPLUS
CN Benzeneacetamide, 4-(oxiranylmethoxy)-, (R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry.

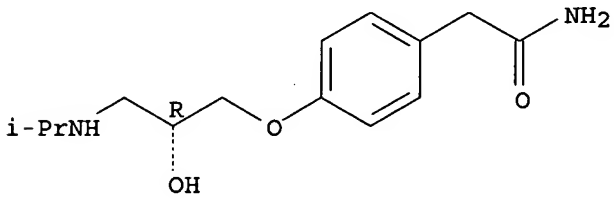


IT **136259-74-0P 136259-76-2P**
RL: **SPN (Synthetic preparation); PREP (Preparation)**
(preparation of)
RN 136259-74-0 HCAPLUS
CN Benzeneacetamide, 4-[2-hydroxy-3-[(1-methylethyl)amino]propoxy]-, (R)-, mono(4-methylbenzenesulfonate) (salt) (9CI) (CA INDEX NAME)

CM 1

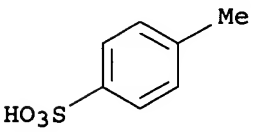
CRN 56715-13-0
CMF C14 H22 N2 O3

Absolute stereochemistry. Rotation (+).



CM 2

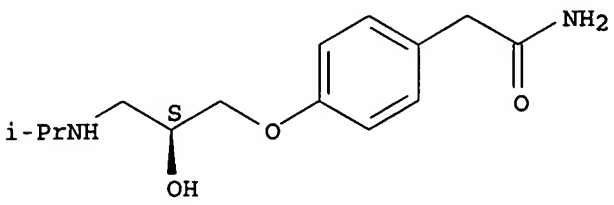
CRN 104-15-4
CMF C7 H8 O3 S



RN 136259-76-2 HCAPLUS
CN Benzeneacetamide, 4-[2-hydroxy-3-[(1-methylethyl)amino]propoxy]-,

monohydrochloride, (S)- (9CI) (CA INDEX NAME)

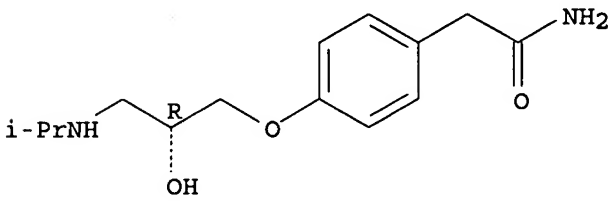
Absolute stereochemistry. Rotation (-).



● HCl

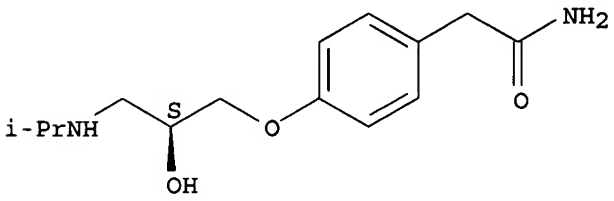
IT **56715-13-0P**, (R)-(+)-**Atenolol** **93379-54-5P**, (S)-(-)-**Atenolol**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(preparation of, improved process for)
RN 56715-13-0 HCAPLUS
CN Benzeneacetamide, 4-[(2R)-2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



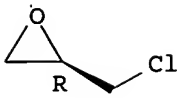
RN 93379-54-5 HCAPLUS
CN Benzeneacetamide, 4-[(2S)-2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).



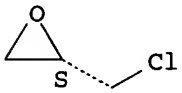
IT **51594-55-9**, (R)-(-)-**Epichlorohydrin**, reactions
67843-74-7, (S)-(+)-**Epichlorohydrin**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(reaction of, with (hydroxyphenyl)acetamide)
RN 51594-55-9 HCAPLUS
CN Oxirane, (chloromethyl)-, (2R)- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (-).

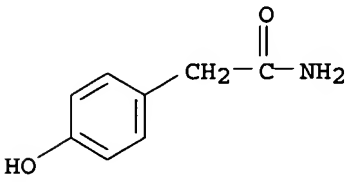


RN 67843-74-7 HCAPLUS
CN Oxirane, (chloromethyl)-, (2S)- (9CI) (CA INDEX NAME)

Absolute stereochemistry. Rotation (+).



IT **17194-82-0**
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(reaction of, with **epichlorohydrins**)
RN 17194-82-0 HCAPLUS
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)



L57 ANSWER 13 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1991:84283 HCAPLUS
DN 114:84283
ED Entered STN: 09 Mar 1991
TI Process for amino alcohol preparation
IN Torres Esteban, Josep Maria; Cuixart Grande, Jesus Maria; Campon Pardo, Julio; Ribalta Baro, Miguel
PA Sintenovo S. A., Spain; Mefar S. A.
SO Span., 4 pp.
CODEN: SPXXAD
DT Patent
LA Spanish
IC ICM C07C089-02
ICS C07C091-08
CC 45-4 (Industrial Organic Chemicals, Leather, Fats, and Waxes)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI ES 2006944	A6	19890516	ES 1988-1514	19880516
PRAI ES 1988-1514		19880516		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
ES 2006944	ICM	C07C089-02
	ICS	C07C091-08

AB The title process for preparing 1-(4-carbamoylmethylphenoxy)-3-isopropylamino-2-propanol comprises reacting phenol with glyoxylic acid at 60° to 4-hydroxymandalic acid, reducing with hydroiodic acid to 4-hydroxyphenylacetic acid, esterifying and aminating to 4-hydroxyphenylactamide, reacting with **epichlorohydrin** to

1-(4-carbamoylmethylphenoxy)-2,3-epoxypropane and 1-(4-carbamoylmethylphenoxy)-3-chloro-2-propanol, and reacting with isopropylamine.

ST amino alc prepn; carbamoylmethylphenoxyisopropylaminopropanol prepn

IT Alcohols, preparation
RL: IMF (Industrial manufacture); PREP (Preparation)
(amino, preparation of)

IT 156-38-7P, 4-Hydroxyphenylacetic acid
RL: RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(preparation and esterification and amination of)

IT **17194-82-0P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and reaction of, with **epichlorohydrin**)

IT **29122-69-8P** 115538-83-5P
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and reaction of, with isopropylamine)

IT 1198-84-1P, 4-Hydroxymandelic acid
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reduction of, by hydroiodic acid)

IT **29122-68-7P**
RL: **IMF (Industrial manufacture)**; **PREP (Preparation)**
(preparation of)

IT 75-31-0, Isopropylamine, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with carbamoylmethylphenoxypropane derivative)

IT 108-95-2, Phenol, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with glyoxylic acid)

IT **106-89-8**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(reaction of, with hydroxyphenylactamide)

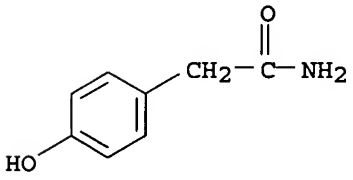
IT 298-12-4, Glyoxylic acid
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with phenol)

IT 10034-85-2, Hydroiodic acid
RL: USES (Uses)
(reductant, for hydroxymandelic acid)

IT **17194-82-0P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and reaction of, with **epichlorohydrin**)

RN 17194-82-0 HCAPLUS

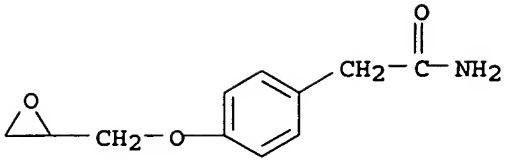
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)



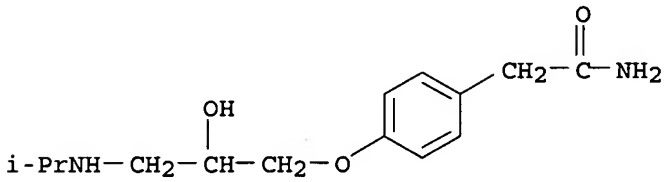
IT **29122-69-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and reaction of, with isopropylamine)

RN 29122-69-8 HCAPLUS

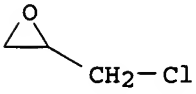
CN Benzeneacetamide, 4-(oxiranylmethoxy)- (9CI) (CA INDEX NAME)



IT **29122-68-7P**
RL: **IMF (Industrial manufacture); PREP (Preparation)**
(preparation of)
RN 29122-68-7 HCAPLUS
CN Benzeneacetamide, 4-[2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI)
(CA INDEX NAME)



IT **106-89-8**, reactions
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(reaction of, with hydroxyphenylactamide)
RN 106-89-8 HCAPLUS
CN Oxirane, (chloromethyl)- (9CI) (CA INDEX NAME)



L57 ANSWER 14 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1989:594562 HCAPLUS
DN 111:194562
ED Entered STN: 25 Nov 1989
TI Preparation of aromatic epoxides as intermediates for β-adrenergic blockers
IN Maehara, Kyoshi; Koshigoe, Taichi; Aoki, Shigeru; Tomyoshi, Noriko; Nagao, Susumu
PA Nippon Kayaku Co., Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 4 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC ICM C07D303-22
ICS B01J031-02; C07D301-00
ICA C07B061-00
CC 27-2 (Heterocyclic Compounds (One Hetero Atom))
Section cross-reference(s): 1
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 01102072	A2	19890419	JP 1987-259481	19871016
PRAI JP 1987-259481		19871016		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 01102072	ICM	C07D303-22
	ICS	B01J031-02; C07D301-00
	ICA	C07B061-00

OS MARPAT 111:194562

AB The title compds. ArOX (Ar = aryl; X = glycidyl), useful as intermediate for **atenolol**, etc., are prepared by treating ArOH with **epichlorohydrin** in the presence of phase-transfer catalyst RR13N+ X- (R = benzyl, C1-8 alkyl; R1 = C1-4 alkyl; X = halo, sulfate) and then ending the reaction by addition of alkali hydroxides. A mixture of p-hydroxyphenylacetamide, Bu4NBr, and **epichlorohydrin** was heated at 65-66° for 1 h and treated with **KOH**-MeOH at 70-72° for 1 h to give 88.5% p-carbamoylmethylphenoxy-2,3-epoxypropane (I), vs., 65.4% using piperidine instead of Bu4NBr. I was treated with isopropylamine in MeOH at 45-50° for 1 h to give **atenolol** (total yield 75%).

ST arom epoxide intermediate adrenergic blocker; oxirane prepn intermediate adrenergic blocker

IT Epoxides
RL: SPN (Synthetic preparation); PREP (Preparation)
(aryl, preparation of, as intermediates for β-adrenergic blockers)

IT Etherification catalysts
(phase-transfer, **quaternary ammonium** salts, for aromatic alcs. with **epichlorohydrin**)

IT **Quaternary ammonium** compounds, uses and miscellaneous
RL: **CAT (Catalyst use)**; USES (Uses)
(tetraalkyl, halides, phase-transfer catalysts, for etherification of aromatic alcs. with **epichlorohydrin**)

IT Adrenergic antagonists
(β-, intermediates for, aromatic epoxides as)

IT **75-57-0**, Tetramethylammonium chloride **1643-19-2**, Tetrabutylammonium bromide
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, for etherification of aromatic alcs. with **epichlorohydrin**)

IT **106-89-8**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(etherification by, of aromatic alcs.)

IT **17194-82-0**, p-Hydroxyphenylacetamide 56718-71-9
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(etherification of, with **epichlorohydrin**)

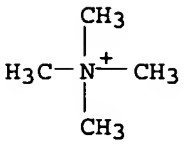
IT **29122-69-8P**, 1-p-Carbamoylmethylphenoxy-2,3-epoxypropane 56718-70-8P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, as intermediate for β-adrenergic blockers)

IT **29122-68-7P**, **Atenolol** 56392-18-8P, Metoprolol hydrochloride
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(preparation of, as β-adrenergic blocker, aromatic epoxides as intermediates for)

IT **75-57-0**, Tetramethylammonium chloride **1643-19-2**, Tetrabutylammonium bromide
RL: **CAT (Catalyst use)**; USES (Uses)
(catalysts, for etherification of aromatic alcs. with **epichlorohydrin**)

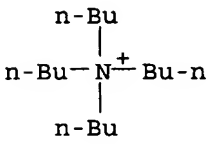
RN 75-57-0 HCAPLUS

CN Methanaminium, N,N,N-trimethyl-, chloride (9CI) (CA INDEX NAME)



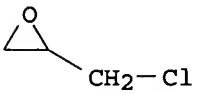
● Cl^-

RN 1643-19-2 HCAPLUS
CN 1-Butanaminium, N,N,N-tributyl-, bromide (9CI) (CA INDEX NAME)

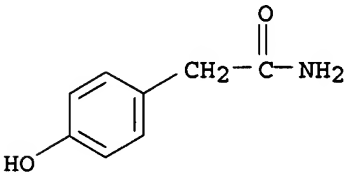


● Br^-

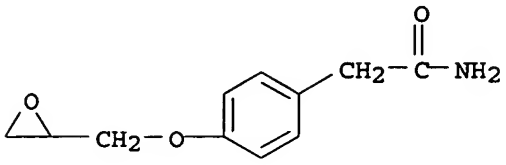
IT **106-89-8**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(etherification by, of aromatic alcs.)
RN 106-89-8 HCAPLUS
CN Oxirane, (chloromethyl)- (9CI) (CA INDEX NAME)



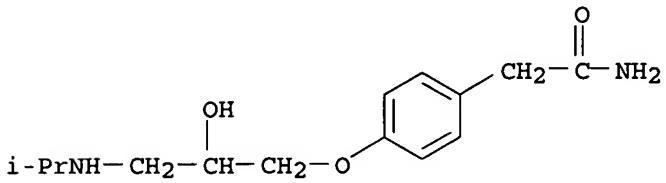
IT **17194-82-0**, p-Hydroxyphenylacetamide
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(etherification of, with **epichlorohydrin**)
RN 17194-82-0 HCAPLUS
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)



IT **29122-69-8P**, 1-p-Carbamoylmethylphenoxy-2,3-epoxypropane
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of, as intermediate for β-adrenergic blockers)
RN 29122-69-8 HCAPLUS
CN Benzeneacetamide, 4-(oxiranylmethoxy)- (9CI) (CA INDEX NAME)



IT **29122-68-7P, Atenolol**
RL: **SPN (Synthetic preparation); PREP (Preparation)**
(preparation of, as β-adrenergic blocker, aromatic epoxides as intermediates for)
RN 29122-68-7 HCAPLUS
CN Benzeneacetamide, 4-[2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI) (CA INDEX NAME)



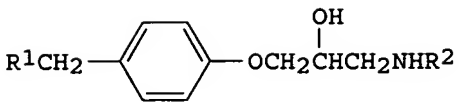
L57 ANSWER 15 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1987:439429 HCAPLUS
DN 107:39429
ED Entered STN: 08 Aug 1987
TI Process for the preparation of (carbamoylmethylphenoxy)isopropanolamines useful as cardiac β-blockers
IN Torres Esteban, Josep Maria; Cuixart Grande, Jesus Maria; Juste Sese, Rafael
PA Juste S. A. Quimico-Farmaceutica, Spain
SO Span., 10 pp.
CODEN: SPXXAD
DT Patent
LA Spanish
IC ICM C07C089-02
ICS C07C091-04; A61K031-13
CC 25-19 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
Section cross-reference(s): 1
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI ES 539244	A1	19860601	ES 1984-539244	19841229
PRAI ES 1984-539244		19841229		

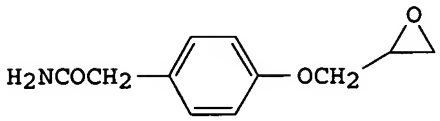
CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
ES 539244	ICM	C07C089-02
	ICS	C07C091-04; A61K031-13

GI



I



II

AB The title compds. [I; R1 = (un)substituted CONH2; R2 = H, Me, Et, Pr, CHMe2, CMe3, etc.], useful as cardiac β-blockers, are prepared Thus, amidation of HO2CCH2C6H4OH-4 via the acid chloride gave 86-88% H2NCOCH2C6H4OH-4, which was alkylated by **epichlorohydrin** in EtOH containing **NaOH** to give (carbamoylmethylphenoxy)epoxypropane II. Aminolysis of II by Me2CHNH2 in H2O at 70° gave I (R1 = CONH2, R2 = CHMe2; i.e. **atenolol**).

ST carbamoylmethylphenoxyisopropanolamine prepn beta blocker; phenoxyisopropanolamine carbamoylmethyl prepn beta blocker; isopropanolamine carbamoylmethylphenoxy prepn beta blocker; **atenolol**

IT **106-89-8**, **Epichlorohydrin**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(alkylation by, of hydroxyphenylacetamide)

IT 156-38-7, p-Hydroxyphenylacetic acid
RL: RCT (Reactant); RACT (Reactant or reagent)
(amidation of, via acid chloride)

IT 75-31-0, Isopropylamine, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(aminolysis by, of (carbamoylmethylphenoxy)epoxypropane)

IT **17194-82-0P**, p-Hydroxyphenylacetamide
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and alkylation of, by **epichlorohydrin**)

IT 37859-23-7P, p-Hydroxyphenylacetyl chloride
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and amidation of)

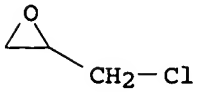
IT **29122-69-8P**, 1-(p-Carbamoylmethylphenoxy)-2,3-epoxypropane
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and aminolysis of)

IT **29122-68-7P**, **Atenolol**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(preparation of, from hydroxyphenylacetic acid)

IT **106-89-8**, **Epichlorohydrin**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(alkylation by, of hydroxyphenylacetamide)

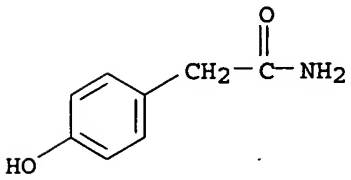
RN 106-89-8 HCAPLUS

CN Oxirane, (chloromethyl)- (9CI) (CA INDEX NAME)

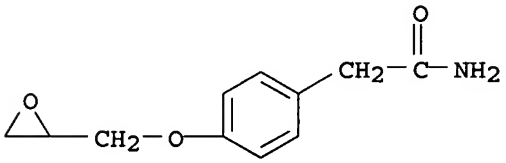


IT **17194-82-0P**, p-Hydroxyphenylacetamide
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**

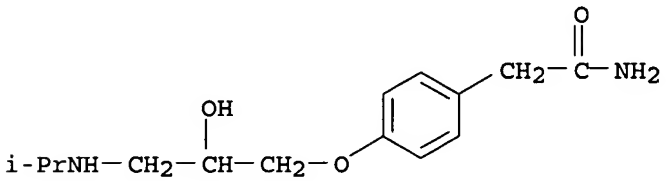
(preparation and alkylation of, by **epichlorohydrin**)
RN 17194-82-0 HCAPLUS
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)



IT **29122-69-8P**, 1-(p-Carbamoylmethylphenoxy)-2,3-epoxypropane
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and aminolysis of)
RN 29122-69-8 HCAPLUS
CN Benzeneacetamide, 4-(oxiranylmethoxy)- (9CI) (CA INDEX NAME)



IT **29122-68-7P, Atenolol**
RL: **SPN (Synthetic preparation); PREP (Preparation)**
(preparation of, from hydroxyphenylacetic acid)
RN 29122-68-7 HCAPLUS
CN Benzeneacetamide, 4-[2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI) (CA INDEX NAME)



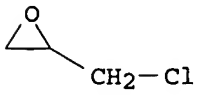
L57 ANSWER 16 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1983:504960 HCAPLUS
DN 99:104960
ED Entered STN: 12 May 1984
TI 2-[P-[2-Hydroxy-3-(isopropylamino)propoxy]phenyl]acetamide
IN Vallas Rodoreda, Enrique
PA Spain
SO Span., 7 pp.
CODEN: SPXXAD
DT Patent
LA Spanish
IC C07C103-26; A61K031-165
CC 25-10 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

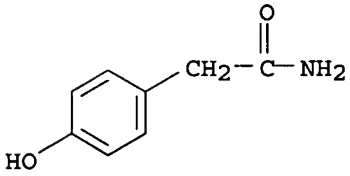
PI ES 509814 A1 19830201 ES 1982-509814 19820223
PRAI ES 1982-509814 19820223
CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
ES 509814	IC	C07C103-26IC A61K031-165

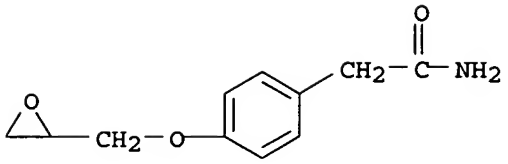
AB The title compound (I) was prepared from 4-HOC6H4CH2CONH2 (II); I is useful as a β-adrenergic blocking agent (no data). II was treated with **epichlorohydrin** and K2CO3 to yield a glycidyl ether, and the product was heated with Me2CHNH2 in Et2O to give I.
ST phenoxyisopropanolamine prepn adrenergic blocker
IT Sympatholytics
(β-, phenoxyisopropanolamine derivative)
IT **106-89-8**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(etherification by, of phenol derivative)
IT **17194-82-0**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(etherification of, by **epichlorohydrin**)
IT **29122-69-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and ring cleavage of, by isopropylamine)
IT **29122-68-7P**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(preparation of)
IT 75-31-0, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(ring cleavage by, of glycidyl (carbamoylmethyl)phenyl ether)
IT **106-89-8**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(etherification by, of phenol derivative)
RN 106-89-8 HCAPLUS
CN Oxirane, (chloromethyl)- (9CI) (CA INDEX NAME)



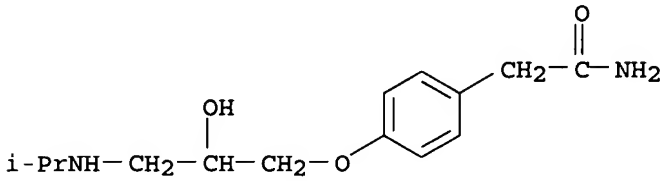
IT **17194-82-0**
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(etherification of, by **epichlorohydrin**)
RN 17194-82-0 HCAPLUS
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)



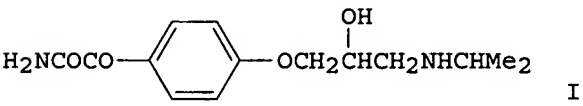
IT **29122-69-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and ring cleavage of, by isopropylamine)
RN 29122-69-8 HCAPLUS
CN Benzeneacetamide, 4-(oxiranylmethoxy)- (9CI) (CA INDEX NAME)



IT **29122-68-7P**
RL: **SPN (Synthetic preparation); PREP (Preparation)**
(preparation of)
RN 29122-68-7 HCAPLUS
CN Benzeneacetamide, 4-[2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI)
(CA INDEX NAME)



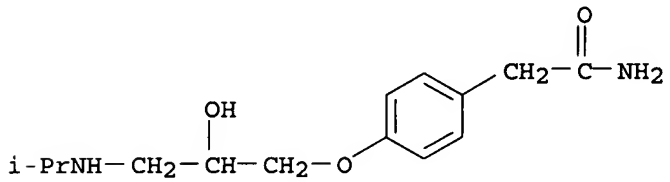
L57 ANSWER 17 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1982:154993 HCAPLUS
DN 96:154993
ED Entered STN: 12 May 1984
TI Studies on the metabolism of **atenolol.** Characterization and determination of a new urinary metabolite in the rat
AU Matsuki, Yasuhiko; Ito, Tomiharu; Komatsu, Sakae; Nambara, Toshio
CS Food Drug Saf. Cent., Hatano Res. Inst., Kanagawa, 257, Japan
SO Chemical & Pharmaceutical Bulletin (1982), 30(1), 196-201
CODEN: CPBTAL; ISSN: 0009-2363
DT Journal
LA English
CC 1-2 (Pharmacology)
Section cross-reference(s): 25
GI



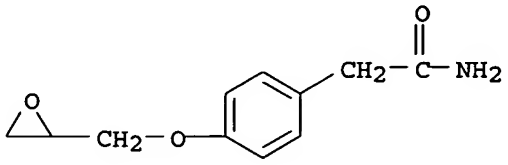
I

AB A new urinary metabolite of **atenolol** [**29122-68-7**] in the rat was characterized and isolated. The metabolite, 4-(2-hydroxy-3-isopropylaminopropoxy)phenylglyoxylic acid amide (I) [74908-93-3], represented 1.04% of the total dose of **atenolol** administered. A gas chromatog. method for the determination of I in urine is presented.
ST **atenolol** metabolite urine; gas chromatog **atenolol** metabolite urine
IT Urine analysis
(**atenolol** metabolite determination in, by gas chromatog.)

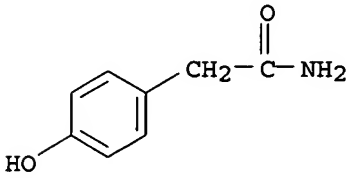
IT **29122-68-7**
RL: BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)
(metabolism of, urinary metabolite determination in)
IT 68758-68-9
RL: RCT (Reactant); RACT (Reactant or reagent)
(oxidation of)
IT 70080-54-5P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and amidation of)
IT 74908-93-3P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation and determination of, in urine, as **atenolol** metabolite)
IT 81346-71-6P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reaction with acetone)
IT 81346-70-5P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reaction with isopropylamine)
IT **29122-69-8P**
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reductive amination of)
IT 81346-72-7P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)
IT **17194-82-0** 81346-69-2
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with **epichlorohydrin**)
IT **29122-68-7**
RL: BPR (Biological process); BSU (Biological study, unclassified); BIOL (Biological study); PROC (Process)
(metabolism of, urinary metabolite determination in)
RN 29122-68-7 HCAPLUS
CN Benzeneacetamide, 4-[2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI) (CA INDEX NAME)



IT **29122-69-8P**
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reductive amination of)
RN 29122-69-8 HCAPLUS
CN Benzeneacetamide, 4-(oxiranylmethoxy)- (9CI) (CA INDEX NAME)



IT **17194-82-0**
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with **epichlorohydrin**)
RN 17194-82-0 HCAPLUS
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)



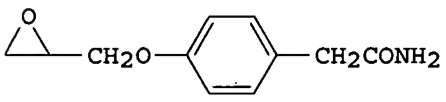
L57 ANSWER 18 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1980:180847 HCAPLUS
DN 92:180847
ED Entered STN: 12 May 1984
TI p-Hydroxybenzyl cyanide and p-(2-hydroxy-3-isopropylaminopropoxy)phenylacetamide
PA Imperial Chemical Industries Ltd., UK
SO Jpn. Kokai Tokkyo Koho, 2 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
IC C07C103-26; C07C121-75; C07C102-00; C07C120-00
CC 25-20 (Noncondensed Aromatic Compounds)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 54148744	A2	19791121	JP 1978-57487	19780515
PRAI JP 1978-57487	A	19780515		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 54148744	IC	C07C103-26IC C07C121-75IC C07C102-00IC C07C120-00

GI



III

AB p-HOC6H4CH2CN (I) was prepared by treating p-HOC6H4CH(NH2)CO2H (II) with alkali metal cyanides in DMF, Me2SO, or 2-pyrrolidone at 120-190°. Hydrolyzing I gave p-HOC6H4CH2CONH2, which was treated with **epichlorohydrin** to give III. Aminating III with Me2CHNH2 gave p-Me2CHNHCH2CH(OH)CH2OC6H4CH2CONH2. Thus, heating 10 g II, NaCN,

NaOH, and DMF 1 h at 130° gave 80% I.

ST hydroxybenzyl cyanide; hydroxyisopropylaminopropoxyphenylacetamide; acetamide hydroxyisopropylaminopropoxyphenyl; cyanation phenylglycine; glycine phenyl cyanation

IT Cyanation
(of phenylglycine, phenylacetonitrile from)

IT 143-33-9 151-50-8
RL: RCT (Reactant); RACT (Reactant or reagent)
(cyanation of phenylglycine by, phenylacetonitrile from)

IT 938-97-6
RL: RCT (Reactant); RACT (Reactant or reagent)
(cyanation of, hydroxyphenylacetonitrile from)

IT **29122-69-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and amination of)

IT 14191-95-8P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and hydrolysis of)

IT **17194-82-0P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and reaction with **epichlorohydrin**)

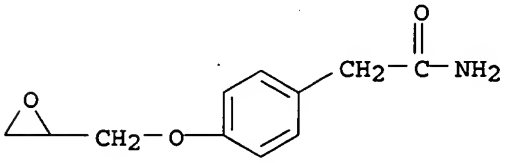
IT **29122-68-7P**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(preparation of)

IT **106-89-8**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(reaction of, with hydroxyphenylacetamide)

IT **29122-69-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and amination of)

RN 29122-69-8 HCAPLUS

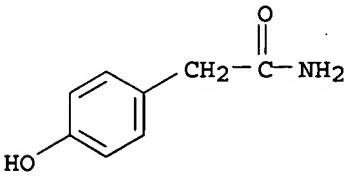
CN Benzeneacetamide, 4-(oxiranylmethoxy)- (9CI) (CA INDEX NAME)



IT **17194-82-0P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and reaction with **epichlorohydrin**)

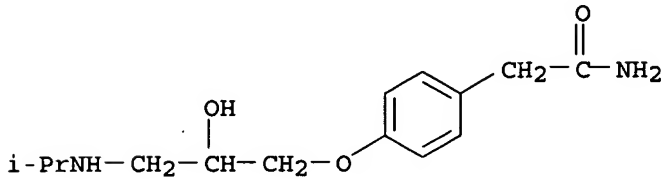
RN 17194-82-0 HCAPLUS

CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)

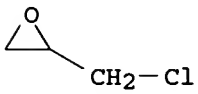


IT **29122-68-7P**

RL: **SPN (Synthetic preparation); PREP (Preparation)**
(preparation of)
RN 29122-68-7 HCAPLUS
CN Benzeneacetamide, 4-[2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI) (CA INDEX NAME)



IT **106-89-8**, reactions
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(reaction of, with hydroxyphenylacetamide)
RN 106-89-8 HCAPLUS
CN Oxirane, (chloromethyl)- (9CI) (CA INDEX NAME)



L57 ANSWER 19 OF 19 HCAPLUS COPYRIGHT 2005 ACS on STN
AN 1978:104956 HCAPLUS
DN 88:104956
ED Entered STN: 12 May 1984
TI Phenylacetamide derivative
IN Juste Sese, Rafael
PA Juste S. A. Quimico-Farmaceutica, Spain
SO Span., 7 pp.
CODEN: SPXXAD
DT Patent
LA Spanish
IC C07C
CC 25-19 (Noncondensed Aromatic Compounds)
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI ES 449244	A1	19770801	ES 1976-449244	19760625
PRAI ES 1976-449244	A1	19760625		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
ES 449244	IC	C07C

AB 4-[Me2CHNHCH2CH(OH)CH2O]C6H4CH2CONH2 (I) was prepared in 4 steps from 4-HOC6H4CO2H, i.e., esterification with MeOH, ammonolysis with aqueous NH4OH, etherification with **epichlorohydrin**, and cleavage of the oxirane ring with excess (50 mol parts) Me2CHNH2. I has β-adrenergic blocking activity and is an antihypertensive agent (no data).
ST phenylacetamide aminohydroxypropoxy; sympatholytic phenylacetamide; antihypertensive phenylacetamide
IT Antihypertensives
(4-[3-(isopropylamino)-2-hydroxypropoxy]phenylacetamide as)
IT Sympatholytics
(β-, 4-[3-(isopropylamino)-2-hydroxypropoxy]phenylacetamide as)
IT 156-38-7

RL: RCT (Reactant); RACT (Reactant or reagent)
(esterification of, with methanol)

IT 14199-15-6P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and ammonolysis of)

IT **17194-82-0P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and reaction of, with **epichlorohydrin**)

IT **29122-69-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and reaction of, with isopropylamine)

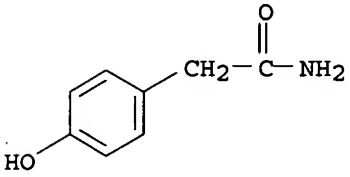
IT **29122-68-7P**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(preparation of)

IT **106-89-8**, reactions
RL: **RCT (Reactant)**; **RACT (Reactant or reagent)**
(reaction of, with (hydroxyphenyl)acetamide)

IT 75-31-0, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with oxirane derivative)

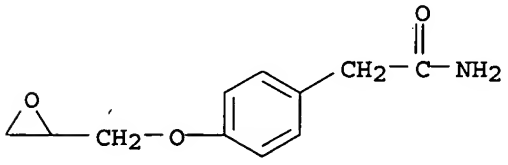
IT **17194-82-0P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and reaction of, with **epichlorohydrin**)

RN 17194-82-0 HCAPLUS
CN Benzeneacetamide, 4-hydroxy- (9CI) (CA INDEX NAME)



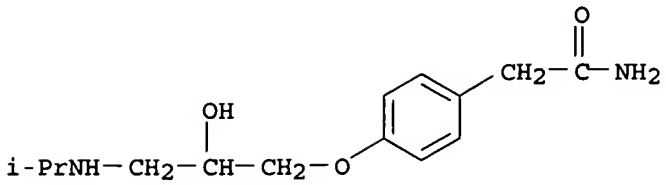
IT **29122-69-8P**
RL: **RCT (Reactant)**; SPN (Synthetic preparation); PREP (Preparation); **RACT (Reactant or reagent)**
(preparation and reaction of, with isopropylamine)

RN 29122-69-8 HCAPLUS
CN Benzeneacetamide, 4-(oxiranylmethoxy)- (9CI) (CA INDEX NAME)

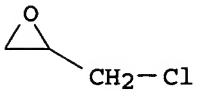


IT **29122-68-7P**
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**
(preparation of)

RN 29122-68-7 HCAPLUS
CN Benzeneacetamide, 4-[2-hydroxy-3-[(1-methylethyl)amino]propoxy]- (9CI) (CA INDEX NAME)



IT **106-89-8**, reactions
RL: **RCT (Reactant); RACT (Reactant or reagent)**
(reaction of, with (hydroxyphenyl)acetamide)
RN 106-89-8 HCAPLUS
CN Oxirane, (chloromethyl)- (9CI) (CA INDEX NAME)



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SET COST OFF

FILE 'REGISTRY' ENTERED AT 10:17:10 ON 11 JAN 2005
E ATENOLOL/CN
L1 1 S E3
E C14H22N2O3/MF
L2 342 S E3 AND 46.150.18/RID AND 1/NR
L3 18 S L2 AND BENZENEACETAMIDE
L4 12 S L3 AND 2 HYDROXY
L5 11 S L4 AND PROPOXY
L6 7 S L5 AND 4
L7 3 S L6 NOT (D/ELS OR 11C#)
L8 3 S L2 AND ATENOLOL
L9 3 S L1,L7,L8
SEL RN
L10 37 S E1-E3/CRN
L11 10 S L10 NOT (MXS/CI OR COMPD OR WITH)
E EPICHLOROHYDRIN/CN
L12 1 S E3
E C3H5CLO/MF
L13 23 S E3 AND OC2/ES
SEL RN 12 17 23
L14 3 S E1-E3
L15 3 S L12,L14
E C11H13NO3/MF
L16 55 S E3 AND 46.150.18/RID AND OC2/ES AND 2/NR
L17 17 S L16 AND 4
L18 5 S L17 AND BENZENEACETAMIDE
L19 3 S L18 NOT D/ELS
E C8H9NO2/MF
L20 392 S E3 AND 46.150.18/RID AND 1/NR
L21 147 S L20 AND 4
L22 1 S L21 AND BENZENEACETAMIDE
L23 9 S L20 AND BENZENEACETAMIDE
L24 2 S (SODIUM HYDROXIDE OR POTASSIUM HYDROXIDE)/CN

FILE 'HCAPLUS' ENTERED AT 11:12:24 ON 11 JAN 2005

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L25          116 S L22
L26        15885 S L15
L27        32010 S EPICHLOROHYDRIN?
L28        35012 S L26,L27
L29           58 S L19
L30         3162 S L9 OR L11
L31         4161 S ATENOLOL
L32         4406 S L30,L31
L33           19 S L25 AND L28 AND L29 AND L32
L34            6 S L33 AND (L24 OR NAOH OR KOH OR (NA OR K OR SODIUM OR POTASSIU
L35            1 S L33 AND (QUAT?(L)AMMON?)
L36            6 S L34,L35
L37          105 S L30 (L) PREP+NT/RL
L38           18 S L33 AND L37
L39         8366 S (L22 OR L28 OR L19)(L)RACT+NT/RL
L40          920 S (L22 OR L28 OR L19)(L)CAT/RL
L41           18 S L38 AND L39,L40
L42            6 S L36 AND L41
L43           13 S L33-L36,L38,L41 NOT L42
L44           19 S L42,L43
                 SEL RN

     FILE 'REGISTRY' ENTERED AT 11:17:17 ON 11 JAN 2005
L45          116 S E1-E116
L46            1 S L45 AND L22
L47            3 S L45 AND L15
L48            3 S L45 AND L19
L49            5 S L45 AND L9,L11
L50          104 S L45 NOT L46-L49
L51            3 S L50 AND IUM
L52            3 S L50 AND N N N
L53            3 S L50 AND N N
L54            3 S L51-L53
L55            1 S L45 AND L24

     FILE 'HCAPLUS' ENTERED AT 11:19:16 ON 11 JAN 2005
L56            2 S L54 AND L44
L57           19 S L44,L56

     FILE 'HCAPLUS' ENTERED AT 11:19:39 ON 11 JAN 2005
                 E MEHTA S/AU
L58          189 S E3,E18
L59            2 S E51
                 E SATISH/AU
L60            1 S E32
                 E RAMANLAL/AU
                 E BHAWAL B/AU
L61           84 S E3,E4,E8,E9
                 E BABURAO/AU
                 E MANIKROA/AU
                 E DESHPANDE/AU
                 E DESHPANDE V/AU
L62           77 S E3,E8
                 E DESHPANDE VISH/AU
L63           22 S E4,E5
                 E VISHNU/AU
L64           58 S E3
                 E HARI/AU
L65            2 S E26
L66           27 S E121
                 E GURJAR /AU
L67          123 S E22-E25
                 E MUKUND/AU
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L68             1 S E5
                  E KESHAV/AU
L69           586 S L58-L68
L70             0 S L69 AND L32
L71            41 S L69 AND P/DT
L72             7 S L69 AND L22,L15,L19
L73             5 S L71 AND L72
L74             2 S L72 NOT L73
L75             0 S L58-L60 AND L61-L68
L76             0 S L61 AND L62-L68
L77             0 S L62-L66 AND L67,L68
                  E IN2003-1148/AP,PRN
                  E IN2003-MU1148/AP,PRN
                  E IN2003-MUM1148/AP,PRN
                  SET COST ON

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  * * * * * * * * * * * * * * STN  Columbus  * * * * * * * * * * * * * * * *

FILE 'HOME' ENTERED AT 08:53:58 ON 11 JAN 2005

=> file casreact
COST IN U.S. DOLLARS                                    SINCE FILE      TOTAL
                                                           ENTRY    SESSION
FULL ESTIMATED COST                                         0.21       0.21

FILE 'CASREACT' ENTERED AT 08:54:22 ON 11 JAN 2005
USE IS SUBJECT TO THE TERMS OF YOUR CUSTOMER AGREEMENT
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for records published or updated in Chemical Abstracts after December
26, 1996), unless otherwise indicated in the original publications.

FILE CONTENT:1840 - 9 Jan 2005 VOL 142 ISS 2

************************************************************
*                                                          *
*     CASREACT now has more than  8 million reactions      *
*                                                          *
************************************************************

Some CASREACT records are derived from the ZIC/VINITI database (1974-1991)
provided by InfoChem, INPI data prior to 1986, and Biotransformations
database compiled under the direction of Professor Dr. Klaus Kieslich.

This file contains CAS Registry Numbers for easy and accurate substance
identification.

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Uploading C:\STNEXP4\10701902.str

L1      STRUCTURE UPLOADED

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L1 HAS NO ANSWERS
L1              STR
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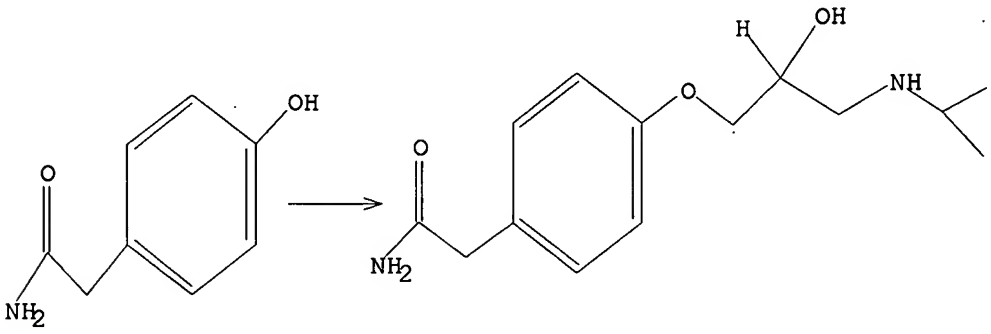


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Structure attributes must be viewed using STN Express query preparation.

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SAMPLE SEARCH INITIATED 08:54:44 FILE 'CASREACT'
SCREENING COMPLETE -      3 REACTIONS TO VERIFY FROM      1 DOCUMENTS
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100.0% DONE 3 VERIFIED 0 HIT RXNS 0 DOCS
SEARCH TIME: 00.00.01

FULL FILE PROJECTIONS: ONLINE **COMPLETE**
BATCH **COMPLETE**
PROJECTED VERIFICATIONS: 3 TO 163
PROJECTED ANSWERS: 0 TO 0

L2 0 SEA SSS SAM L1 (0 REACTIONS)

=> s l1 ful
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SCREENING COMPLETE - 129 REACTIONS TO VERIFY FROM 28 DOCUMENTS

100.0% DONE 129 VERIFIED 11 HIT RXNS 6 DOCS
SEARCH TIME: 00.00.01

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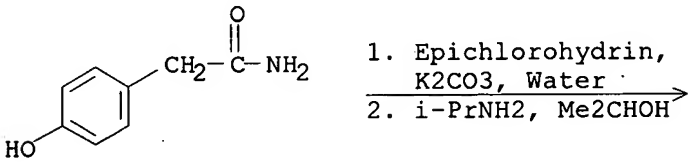
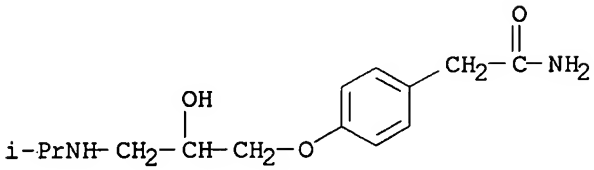
L3 ANSWER 1 OF 6 CASREACT COPYRIGHT 2005 ACS on STN

RX(13) OF 28 - 2 STEPS





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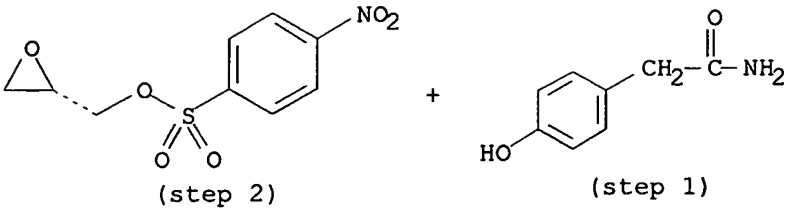
REF: Huaihai Gongxueyuan Xuebao, 9(2), 36-38; 2000

L3 ANSWER 2 OF 6 CASREACT COPYRIGHT 2005 ACS on STN

RX(2) OF 20



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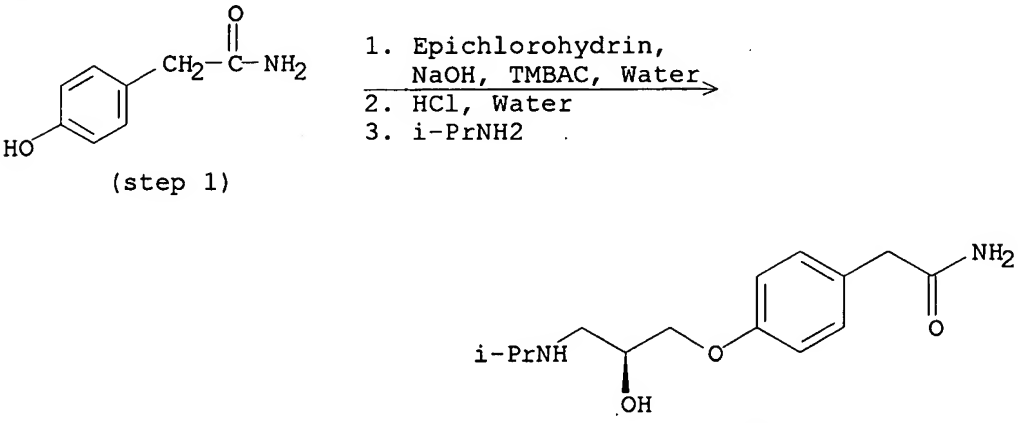
REF: Tetrahedron, 55(50), 14381-14390; 1999
NOTE: STEREOSELECTIVE

L3 ANSWER 3 OF 6 CASREACT COPYRIGHT 2005 ACS on STN

RX(1) OF 7



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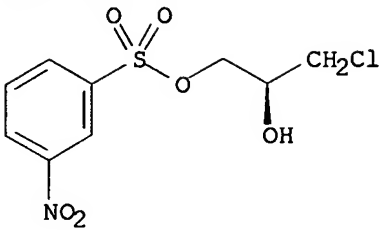
REF: Jpn. Kokai Tokkyo Koho, 04198175, 17 Jul 1992, Heisei

L3 ANSWER 4 OF 6 CASREACT COPYRIGHT 2005 ACS on STN

RX(2) OF 4



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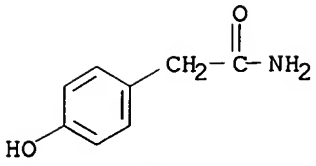

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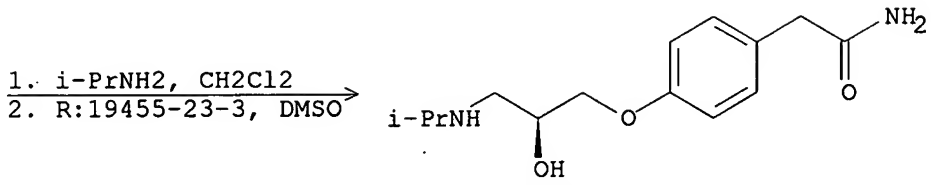
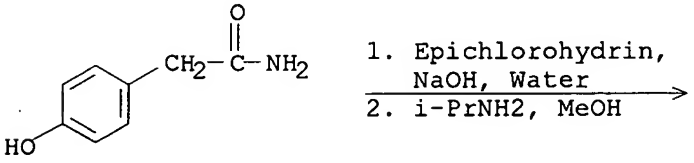
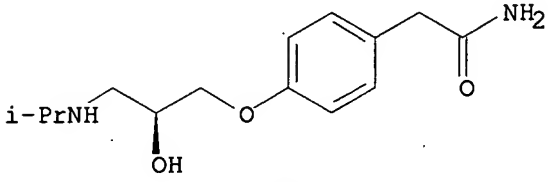


REF: PCT Int. Appl., 9110642, 25 Jul 1991
NOTE: stereoselective

L3 ANSWER 5 OF 6 CASREACT COPYRIGHT 2005 ACS on STN

RX(3) OF 3 - 2 STEPS





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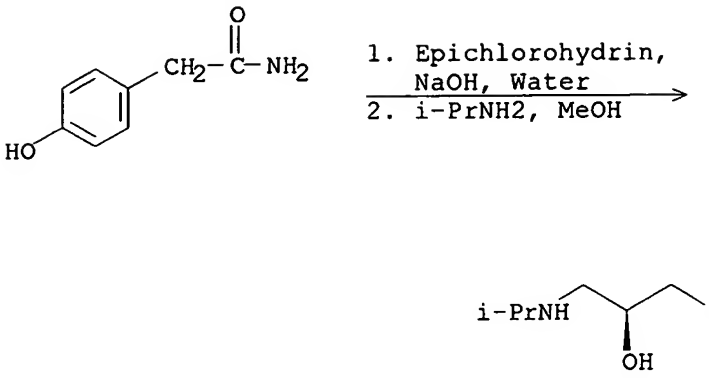
REF: Jpn. Kokai Tokkyo Koho, 03077856, 03 Apr 1991, Heisei

L3 ANSWER 6 OF 6 CASREACT COPYRIGHT 2005 ACS on STN

RX(6) OF 8 - 2 STEPS



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REF: Eur. Pat. Appl., 435068, 03 Jul 1991